ISSUE REPORT

Ready or Not?

PROTECTING THE PUBLIC'S HEALTH FROM DISEASES, DISASTERS, AND BIOTERRORISM 2009

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ACKNOWLEDGEMENTS

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H1N1
FLU CLINIC

Introduction

H1N1 HAS BEEN A REAL-WORLD TEST OF THE NATION'S PUBLIC HEALTH SYSTEM.

Over the past seven years, versions of this report, *Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism,* have documented how investments in America's public health emergency response capabilities have led to major improvements in our nation's readiness for an outbreak or emergency. This progress has meant that the country was much more prepared to respond the H1N1 outbreak than it was just a few short years ago. For instance, these investments have increased the country's vaccine manufacturing capacity, contributed to a more robust stockpile of antiviral medications, upgraded laboratories and surveillance systems, and assisted in the development of federal, state, and local preparedness plans around the country.

However, the H1N1 outbreak also vividly demonstrated the existing gaps in public health preparedness. Decades of chronic underfunding of public health meant that many of the core systems that would have been invaluable to have in place during an emergency were not at-the-ready when H1N1 emerged. Congress and the Administration provided additional band-aid supplemental funds to respond to the crisis, but these funds were largely dedicated to the immediate needs, like vaccine purchasing and distribution, and were not sufficient to address underlying gaps, such as hiring dedicated staff to track, monitor, and respond to the pandemic or updating electronic surveillance systems for tracking and sharing information.

The public health system's response to H1N1 was further challenged by the current economic climate. State and local health departments around the country were asked to do more with less during the outbreak, as the recession stripped $168 billion, or one-quarter, from state budgets.

The annual *Ready or Not?* reports have shown that the band-aid approach the nation takes toward responding to the emergency du jour is inadequate. After September 11, 2001 and the anthrax attacks, the federal government made an unprecedented investment to quickly shore up components of public health preparedness, but the funding levels were not at the level required to fix the infrastructure. Over the years, as new emergencies and concerns emerge and attention shifts, it often means resources are diverted from one pressing priority to another, leaving other ongoing areas unaddressed. In addition, the progress that has been made since September 11, 2001 has been undermined as funding for preparedness has been cut 27 percent since fiscal year 2005 when adjusted for inflation. Until public health emergency preparedness receives sufficient and sustained funding, Americans will continue to be needlessly at risk for a range of public health threats.

TFAH issues the *Ready or Not?* report to provide the public and policymakers with an independent analysis about progress and vulnerabilities in the nation's public health preparedness. The report assesses the level of preparedness in states, evaluates the federal government's role and performance, and offers recommendations for improving emergency preparedness.

Little information is publicly and readily available from the government about the status of health emergency preparedness in the United States. This report aims to foster greater accountability for how effectively taxpayer dollars are used to improve the nation's readiness for health emergencies. Without this transparency, it is hard for the American public to know how well the government is protecting them from the range of threats our nation faces.

The report:

- Informs the public and policymakers about the status of public health preparedness in the United States;
- Provides greater transparency for public health preparedness programs;
- Encourages greater accountability for the spending of preparedness funds; and
- Recommends ways to help the nation move toward a strategic, all-hazards system capable of responding effectively to health threats posed by diseases, disasters, and bioterrorism.

The H1N1 pandemic illustrated the great variation in levels of preparedness around the country. Some communities were much more prepared to respond to the outbreak than others. In general, some communities are better prepared for different types of threats. A hazard and vulnerability assessment, for example, might identify hurricanes

as a major threat in one part of the country, while wildfires receive higher priority in another. In an era of limited federal and state resources, states must align limited preparedness dollars with the highest ranked threats. However, H1N1 was a vivid reminder that every community needs to maintain a basic level of preparedness to cope with unexpected disease outbreaks or other emergencies that might emerge.

Variation in preparedness in and across states and communities means that where people live can determine how well they are protected from threats to their health. In the case of a pandemic or infectious disease outbreak, one weak link in the public health chain can result in disaster for everyone.

This 2009 edition of the *Ready or Not?* report focuses on reviewing state and federal public health emergency preparedness. The contents include:

- **Section 1:** An examination of state-by-state public health preparedness, in which states are evaluated on 10 key preparedness indicators, based on input and review from public health experts.
- **Section 2:** A review of federal preparedness that includes information on the ongoing response to the H1N1 pandemic, leadership and public health preparedness funding, the replenishment of national stockpiles of medical countermeasures and supplies, and the development of near real-time biosurveillance systems.
- **Section 3:** A discussion of health care system preparedness, including the development of surge capacity plans for staff, space, and supplies, and the planning and development of crisis standards of care to be used in a mass casualty event. The financing of health care system preparedness – an issue not addressed by the current health reform legislation before Congress – is also examined.
- **Section 4:** Recommendations for improving all-hazards and pandemic preparedness.

Ready or Not? 2009: Major Conclusions

The 2009 *Ready or Not?* report finds that the investments made to improve public health emergencies over the past several years are demonstrating a major payoff as the nation confronts the H1N1 pandemic. At the same time, many core areas of public health preparedness are severely lacking and in urgent need of modernization to be ready for the next potential public health emergency, while also performing the vital tasks needed to protect our daily health. Strengthening the public health workforce, health care surge capacity, and disease tracking and surveillance are major issues of continuing concern.

Ready or Not? 2009: Key Findings

Indicator	Finding
1. Mass Distribution -- State Antiviral Purchases	13 states have purchased less than 50 percent of their share of federally-subsidized antiviral drugs to stockpile for use during an influenza pandemic.
2. Hospital Preparedness -- Hospital Bed Availability Reporting	10 states and the District of Columbia do not submit weekly data for at least 50 percent of the hospitals within their jurisdiction to the National Hospital Available Beds for Emergencies and Disasters (HAvBED) System as required by ASPR during the 2009 H1N1 response.
3. Public Health Laboratories -- Lab Pick Up and Delivery Services	14 states do not have the capacity in place to assure the timely transportation (pick-up and delivery) of samples 24/7, 365 days to the appropriate public health Laboratory Response Network (LRN) reference laboratory.
4. Public Health Laboratories -- Surge Workforce	11 states and D.C. do not have enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1.
5. Biosurveillance	6 states do not have a disease surveillance system that is compatible with CDC's National Electronic Disease Surveillance System (NEDSS).
6. Food Safety -- Detection and Diagnosis	14 states were not able to identify the pathogen responsible for reported food-borne disease outbreaks at a rate that met or exceeded the national average of 46 percent (combined data 2005-2007).
7. Medical Reserve Corps Readiness	9 states do not meet the Medical Reserve Corps readiness criteria
8. Community Resiliency -- Children and Preparedness	Only 20 states and D.C. have laws requiring licensed childcare facilities to have a multi-hazard written evacuation and relocation plan, and verification that laws are implemented.
9. Legal Preparedness -- Entity Emergency Liability Protection	18 states have not adopted entity emergency liability protections or have made no formal determination under existing law.
10. Public Health Funding Commitment -- State Public Health Budgets	27 states cut funding for public health from FY 2007-08 to FY 2008-09.

Summary of Key Preparedness Improvements and Concerns

Federal legislation and funding	**Progress:** ■ The 2009 Supplemental for H1N1 (P.L. 111-32) included $7.7 billion, of which $5.8 billion was contingency funding, for HHS to develop, purchase, and administer H1N1 vaccine, enhance influenza surveillance, and assist state and local health departments with mass vaccination plans and H1N1 response.[1] **Concerns:** ■ Federal funding for public health emergency preparedness and hospital preparedness has declined 27 percent since FY 2005 when adjusted for inflation. While additional funding has been provided to respond to emergencies, this is less effective than ongoing support for preparedness.
Accountability, oversight, and transparency	**Progress:** ■ As of November 2009, CDC had introduced new, evidence-based benchmarks for two of the five areas identified for initial performance measure development: Incident Management and Crisis & Emergency Risk Communications (CERC). Work continues on outcome- oriented objectives for the remaining three priority areas: Biosurveillance, Countermeasure Distribution, and Community Containment strategies. ■ All 50 states and D.C. have state-wide strategic pandemic plans that were submitted to HHS for a federal government review. HHS released the state grades in January 2009 -- four months before the first wave of the H1N1 pandemic. ■ The federal government has been remarkably transparent with the American people about this pandemic since it began last spring. The federal effort appears to be well coordinated with all cabinet and subcabinet officials working from the same playbook. Public health officials have leveled with the American people -- making appropriate adjustments in recommendations as our understanding of the nature of the pandemic has evolved. The same has held true as supply issues have arisen. The constantly updated public health information has led to some understandable confusion among the public, but it has reflected an honest attempt to reflect the current state of knowledge. **Concerns:** ■ Three years after the Pandemic and All-Hazards Preparedness Act (PAHPA) was signed into law mandating the creation of evidence-based performance measures and objectives, neither CDC nor ASPR have put forth evidence-based guidelines regarding the conduct of emergency preparedness exercises in terms of what outcomes are expected from each test, or how to use the lessons learned to enhance preparedness.
Gaps in "plans on paper" versus reality of response	**Progress:** ■ All states and D.C. have plans to receive and distribute emergency vaccines, antidotes, and medical supplies from the Strategic National Stockpile (SNS). **Concerns:** ■ Despite years of planning, many state health departments have struggled with limited resources to develop mass vaccination plans to receive, distribute, and administer the H1N1 vaccine, raising concerns about the ability of the public health sector to collaborate with the health care system.
Laboratory improvement	**Progress:** ■ New technology developed in part with HHS funding was used to identify the novel influenza A/H1N1 virus in California and quickly led federal officials to declare a public health emergency. **Concerns:** ■ During the first wave of H1N1 in the spring of 2009, laboratory testing capability was quickly overwhelmed in some states by the surge in specimens, which affected the ability of health officials to get an up-to-date, real-time understanding of the progress of the disease across the country.
Biosurveillance	**Progress:** ■ CDC, together with state and local health agencies, was able to turn a novel approach to surveillance into a real-time display of summarized daily data for influenza surveillance ahead of the second wave of the H1N1 outbreak. As of October 6, 2009, 19 states and five local health departments were reporting data to the Distribute system. **Concerns:** ■ Despite a federal mandate, the United States continues to lack an integrated, national approach to biosurveillance that is capable of responding to catastrophic health threats or to more familiar problems such as the contamination of food supplies. ■ States report data to CDC on a voluntary basis and the quality of the data reported varies greatly among state health departments, and even among programs in the same state health department.
State public health funding	**Progress:** ■ As mandated by the 2006 Pandemic and All Hazards Act, as of FY 2009 public health and hospital preparedness grant awardees must contribute five percent in non-federal funds to support the cooperative agreements. The contribution grows to 10 percent in subsequent fiscal years. **Concerns:** ■ A majority of states decreased funding for public health services in FY 2008-09 as the worst economic recession since World War II led states to slash services, and often disproportionately slashed public health budgets

Summary of Key Preparedness Improvements and Concerns	
Management and contents of the Strategic National Stockpile	**Progress:** ■ Prior to the H1N1 outbreak in the spring of 2009, the Strategic National Stockpile contained pandemic flu countermeasures such as 50 million antiviral treatment courses, 105.8 million N95 respirator masks, and 51.7 million surgical masks. **Concerns:** ■ CDC has deployed many of the pandemic flu countermeasures held in the SNS, including the majority of the N95 respirators and Tamiflu pediatric suspension, to state and local public health departments and health care systems. There are no plans or funding to replenish the antivirals, N95 respirator masks, or surgical masks before the third wave of the H1N1 pandemic.
Vaccine industry	**Progress:** ■ The Biomedical Advanced Research and Development Authority (BARDA) awarded one federal contract for $487 million last spring to Novartis for the construction of the first U.S. facility to manufacture cell-based flu vaccine. That facility is scheduled to open in December 2009, but will not begin producing licensed vaccine until 2014.[2] **Concerns:** ■ Despite HHS having spent more than $1 billion in federal dollars to enhance vaccine manufacturing capacity, we are still reliant on old egg-based production lines, which contributed to delays in production and delivery of the H1N1 vaccine.
Surge planning and capacity	**Progress:** ■ The Institute of Medicine published *Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations: A Letter Report* in September 2009, which includes a five-step process for emergency planners to follow when developing crisis standards of care. ■ HHS is using an online tracking tool, HAvBED or the Hospital Available Beds for Emergencies and Disasters, to help health care systems and regions care for a surge of patients in the event of a mass casualty incident. **Concerns:** ■ Few states have developed crisis standards of care, and there is no federal clearinghouse to share information on best practices for planning and development of crisis standards of care. ■ There has been limited public outreach regarding how the U.S. health care system will function in a public health emergency, which could lead to confusion and/or mistrust of the system if a mass casualty event were to occur.
Community resiliency	**Progress:** ■ The Obama administration created a Long-Term Disaster Recovery Working Group to strengthen disaster recovery and ensure a more resilient nation. The Secretaries of Homeland Security and Housing and Urban Development are co-chairing the Long-Term Disaster Recovery Working Group composed of the Secretaries and Administrators of more than 20 departments, agencies and offices. **Concerns:** ■ Low-income and racial/ethnic minority communities continue to suffer disproportionately during public health emergencies. Initial reports on the spring wave of H1N1 revealed that African-Americans and Hispanics were hospitalized at significantly higher rates than white Americans, most likely because they suffer more from underlying chronic health conditions, like asthma and diabetes.

ALL-HAZARDS APPROACH TO EMERGENCY PUBLIC HEALTH THREATS

The U.S. public health system is responsible for protecting the American people from a range of potential health threats. An all-hazards public health system is one that is able to respond to and protect citizens from the full spectrum of possible public health emergencies, including bioterrorism and naturally occurring health threats. An all-hazards system recognizes that preparing for one threat can have benefits that will help prepare public health departments for all potential threats.

Under an all-hazards approach, the public health system prepares for and is able to respond to unique concerns posed by different threats. For instance, threats may be:

- Isolated at our borders, or regionally, or be national or global in scope;
- Of limited duration or occur in repeated waves; and
- Preventable and treatable through vaccines and medications, or there may be no pharmaceutical interventions available.

EXAMPLES OF MAJOR EMERGENCY PUBLIC HEALTH THREATS

Agroterrorism: The "…deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability."[3] Agroterrorism can be considered a subcategory of "bioterrorism" and foodborne diseases.

Bioterrorism: The intentional or deliberate use of germs, biotoxins, or other biological agents that cause disease or death in people, animals, or plants. Examples include anthrax, smallpox, botulism, Salmonella, and E. coli.

Blast Injuries: Explosions, whether deliberate or accidental, can cause multi-system, life threatening injuries among individuals and within crowds. Blunt and penetrating injuries to multiple organ systems are likely when an explosion occurs. Also, unique injuries to the lungs and central nervous system occur during explosions.

Chemical terrorism: The deliberate use of chemical agents, such as poisonous gases, arsenic, or pesticides that have toxic effects on people, animals, or plants in order to cause illness or death. Examples include ricin, sarin, and mustard gas.

Chemical incidents and accidents: The non-deliberate exposure of humans to harmful chemical agents, with similar outcomes to chemical terrorism.

Food-borne diseases: Food-borne illness is caused by harmful bacteria, viruses, parasites or chemicals that are found in food and beverages and enter the body through the gastrointestinal tract. The Centers for Disease Control and Prevention (CDC) estimates there are approximately 76 million pathogen-induced cases of food-borne diseases each year in the United States, causing approximately 325,000 hospitalizations and 5,000 deaths. Examples include botulism, Salmonella, E.coli 0157:H7, shigella, and norovirus.

Natural disasters: Harm can be inflicted during and after natural disasters, which can lead to contaminated water, shortages of food and water, loss of shelter, and the disruption of regular health care. Examples include hurricanes, earthquakes, tornados, mudslides, fires, and tsunamis.

Pandemic flu: A novel, potentially lethal strain of the influenza against which humans have no natural immunity. The current novel influenza A/H1N1 strain circulating widely in the United States and around the world is the first pandemic flu of the 21st century. Historically, pandemic flu occurs two to three times every hundred years or so. In the 20th century the world experienced the 1918, 1957/58, and 1968 pandemic flu, although the severity of the disease varied greatly among them.

Radiological threats: Intentional or accidentally-caused exposure to radiological material. A terrorist attack could involve the scattering of radioactive materials through the use of explosives ("dirty bomb"), the destruction of a nuclear facility, the introduction of radioactive material into a food or water supply, or the explosion of a nuclear device near a population center.

Vector-borne diseases: Diseases spread by vectors, such as insects. Examples include the West Nile virus, Rocky Mountain spotted fever, and malaria.

Water-borne diseases: Diseases spread by contaminated drinking water or recreational water, such as typhoid fever and cholera. According to CDC, over 1,000 persons become ill from contaminated drinking water and over 2,500 persons become ill from recreational water disease outbreaks annually in the United States.[4]

Zoonotic/Animal-borne diseases: Animal diseases that can spread to humans and in some cases, become contagious from human to human. Examples include Avian flu, West Nile virus, and SARS. In 2000, the World Health Organization (WHO) identified more than 200 diseases occurring in humans that were known to be transmitted through animals.[5] Experts believe that the increased emergence of zoonotic diseases worldwide can be attributed to population displacement, urbanization and crowding, deforestation, and globalization of the food supply.

WHAT DOES ALL-HAZARDS PREPAREDNESS LOOK LIKE?

The goals of 24/7 public health emergency eesponse include:

- Rapid **detection** of and **response** to emergency disease threats, including those caused by bioterrorism.
- Intensive **investigative** capabilities to quickly diagnose an infectious disease outbreak or to identify the biological or chemical agent used in an attack.
- **Surge capacity** for mass events, including adequate facilities, equipment, supplies, and trained health professionals.
- **Mass containment strategies**, including pharmaceuticals needed for **antibiotic or antidote administration** and **isolation and quarantining** when necessary.
- Streamlined and effective **communication** channels so health workers can swiftly and accurately communicate with each other, other front line workers, and the public about 1) the nature of an emergency or attack, 2) the risk of exposure and how to seek treatment when needed, and 3) any actions they or their families should take to protect themselves.
- Communications must also be able to reach and take into consideration at-risk populations.
- Streamlined and effective evacuation of at-risk populations with special medical needs.
- An informed and involved public that can provide material and moral support to professional responders, and can render aid when necessary to friends, family, neighbors, and associates.

What it will take to achieve basic levels of preparedness:

- **Leadership, planning, and coordination:** An established chain-of-command and well defined roles and responsibilities for seamless operation across different medical and logistical functions and among federal, state, and local authorities during crisis situations, including police, public safety officials, and other first responders.
- **Well-funded core public health infrastructure:** Basic public health systems and equipment, including laboratory testing and communications that keeps pace with advances in science and technology.
- **An expert and fully-staffed workforce:** Highly trained and adequate numbers of public health professionals, including epidemiologists, lab scientists, public health nurses and doctors, and other experts, in addition to back-up workers for surge capacity conditions.
- **Modernized technology:** State-of-the-art laboratory equipment, information collection, and health tracking systems.
- **Pre-planned, safety-first rapid emergency response capabilities and precautions:** Tested plans and safety precautions to mitigate potential harm to communities, public health professionals, and first responders.
- **Immediate, streamlined communications capabilities:** Coordinated, integrated communications among all parts of the public health system, all frontline responders, and with the public. Must include back-up systems in the event of power loss or overloaded wireless channels.

FEDERAL, STATE, AND LOCAL PUBLIC HEALTH JURISDICTIONS

The federal role: Includes policymaking, funding programs, overseeing national disease prevention efforts, collecting and disseminating health information, building capacity, and directly managing some services.[6] Some public health capabilities, such as the Strategic National Stockpile (SNS), are federal assets managed by federal agencies that are available to supplement a state's and community's response to a public health emergency that overwhelms or may overwhelm their capabilities. Public health functions are widely diffused across eight federal agencies and two offices.

State and local roles: Under U.S. law, state governments have primary responsibility for the health of their citizens. Constitutional "police powers" give states the ability to enact laws and issue regulations to protect, preserve, and promote the health, safety, and welfare of their residents. In most states, state laws charge local governments with responsibility for the health of their citizens. State and local health departments and first responders are the front line in any public health emergency.

Some of the ongoing problems resulting from this diffused structure include:

1. Lack of clear roles for the various state, local, and federal agencies.
2. Differing responsibilities and capacities among the some 3,000 local health departments.
3. Limited coordination among the levels of government, including determination of how federal assets would be deployed to states and localities, and across jurisdictions, such as sharing assets and resources among states.
4. No minimum standards, guidelines, or recommendations for capacity levels or services are required of state and local health departments. This results in major differences in services and competencies across state and local agencies.
5. Lack of funding flexibility and comprehensiveness due to a federal funding structure that is largely based on categorical or program grants. These often restrictive grants also lack a system of accountability.

SECTION 1

State-by-State Public Health Preparedness Indicators and Scores

All Americans have the right to expect fundamental health protections during public health emergencies, no matter where they live.

To help assess health emergency preparedness, this section of the *Ready or Not?* report examines a series of 10 indicators of preparedness in each state that, taken collectively, offer a composite snapshot of strengths and vulnerabilities.

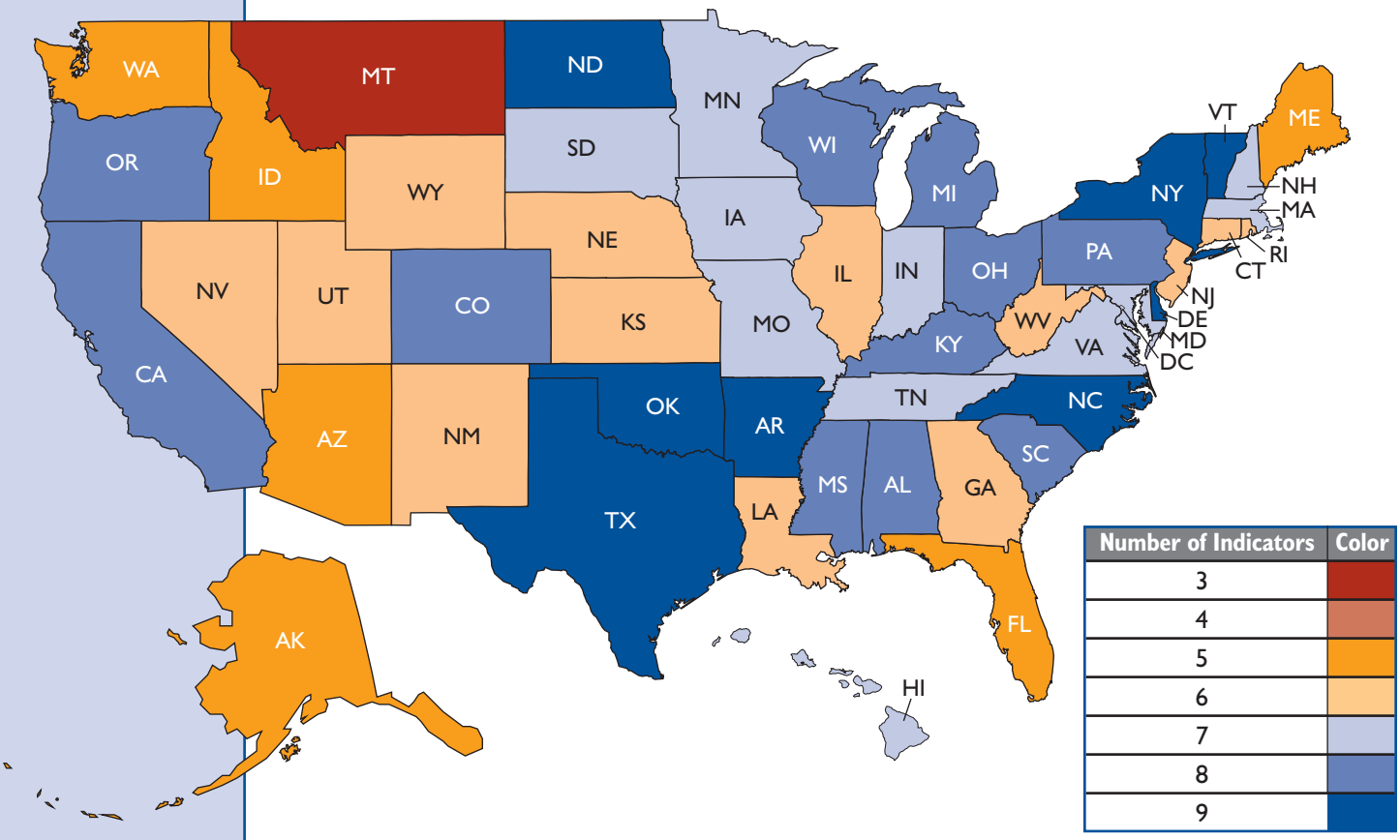
While federal, state, and local health departments, and private health providers all have roles to play in public health preparedness, states have primary legal jurisdiction and responsibility for the health of their citizens.[7] In addition, the federal government provides funding for preparedness to states. Since the terrorist attacks of September 11, 2001, the U.S. Centers for Disease Control and Prevention (CDC) has provided nearly $7 billion in preparedness funding to states and some major cities.

States differ in how they structure, deliver and fund public health services, and different states have different strengths and vulnerabilities in capabilities. States with multiple, high-density urban areas may function very differently than those with fewer residents spread across smaller cities and towns. However, all states should be able to meet basic preparedness goals as defined by federal health officials.

This report was developed to provide taxpayers and policymakers with information about how well-prepared their states and communities are for different types of health threats. The American people deserve to know how prepared their states and communities are for different types of health threats, particularly when their taxpayer dollars are being spent to support preparedness efforts. Currently, the American public is not equipped with enough information to monitor and hold public officials accountable for whether their communities are adequately prepared.

Limited data is made publicly available to measure public health preparedness. In fact, despite the allocation of nearly $7 billion in federal public health preparedness funds to states and localities over the past six years, reliable, valid performance measures to evaluate emergency preparedness are still to be fully developed, despite numerous commissions and studies that were funded to create them. In 2008, the CDC issued a report on states' preparedness, which largely focused on the development of plans and process indicators, and the data was outdated.[8] (An updated version of this report is due out in the spring of 2010.) This was an important first step, but more must be done. In all seven years of the *Ready or Not?* report, TFAH has called for the government to develop national performance standards and to publicly release information on a routine basis about states' progress in meeting those standards.

This *Ready or Not?* report compiles indicators based on the best publicly available data or data received from surveying states directly. Each state receives a score based on 10 key indicators. States receive one point for achieving an indicator or zero points if they do not achieve the indicator. Zero is the lowest possible overall score, and 10 is the highest. (For more information, please see Appendix C: Data and Methodology for State Indicators.)



SCORES BY STATE

9 (8 states)	8 (11 states & D.C.)	7 (11 states)	6 (13 states)	5 (6 states)	4 (0 states)	3 (1 state)
Arkansas	Alabama	Hawaii	Connecticut	Alaska		Montana
Delaware	California	Indiana	Georgia	Arizona		
New York	Colorado	Iowa	Illinois	Florida		
North Carolina	D.C.	Maryland	Kansas	Idaho		
North Dakota	Kentucky	Massachusetts	Louisiana	Maine		
Oklahoma	Michigan	Minnesota	Nebraska	Washington		
Texas	Mississippi	Missouri	Nevada			
Vermont	Ohio	New Hampshire	New Jersey			
	Oregon	South Dakota	New Mexico			
	Pennsylvania	Tennessee	Rhode Island			
	South Carolina	Virginia	Utah			
	Wisconsin		West Virginia			
			Wyoming			

STATE PREPAREDNESS SCORES

States	(1) Purchased 50 percent or more of their share of federally-subsidized antivirals.	(2) State health department submitted data on available beds weekly for at least 50 percent of the facilities within their state to HAvBED System as required by ASPR during the 2009 H1N1 response.	(3) State public health lab has the capacity in place to assure the timely transportation (pick-up and delivery) of samples 24/7, 365 days to the appropriate public health Laboratory Response Network (LRN) reference laboratory.	(4) State public health lab reports having enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1.	(5) State has disease tracking system to collect and monitor data electronically via the Internet.	(6) State identified the pathogen responsible for reported foodborne disease outbreaks at a rate that met or exceeded the national average of 46 percent (combined data 2005-2007).	(7) State meets the Medical Reserve Corps (MRC) readiness criteria.	(8) State requires all licensed childcare facilities to have a multi-hazard written evacuation and relocation plan.	(9) State has either enacted entity liability laws or has made a formal and official determination that existing law provides such protections.	(10) Increased or maintained level of funding for public health services from FY 2007-08 to FY 2008-09	2009 Total Score
Alabama	✓		✓	✓	✓		✓	✓	✓	✓	8
Alaska	✓	✓		✓	✓	✓					5
Arizona		✓	✓	✓	✓		✓				5
Arkansas	✓	✓		✓	✓	✓	✓	✓	✓	✓	9
California	✓	✓	✓	✓	✓		✓	✓	✓		8
Colorado		✓	✓	✓	✓	✓	✓		✓	✓	8
Connecticut		✓	✓	✓		✓	✓			✓	6
Delaware	✓	✓		✓	✓	✓	✓	✓	✓	✓	9
D.C	✓		✓		✓	✓	✓	✓	✓	✓	8
Florida			✓	✓	✓		✓		✓		5
Georgia	✓				✓	✓	✓		✓	✓	6
Hawaii	✓		✓	✓	✓	✓	✓	✓			7
Idaho					✓	✓	✓		✓	✓	5
Illinois	✓	✓		✓	✓		✓			✓	6
Indiana	✓	✓		✓	✓	✓	✓		✓		7
Iowa	✓	✓	✓		✓	✓			✓	✓	7
Kansas	✓	✓	✓	✓			✓		✓		6
Kentucky	✓	✓	✓	✓	✓	✓	✓			✓	8
Louisiana	✓		✓		✓	✓	✓		✓		6
Maine	✓	✓		✓	✓		✓				5
Maryland	✓	✓	✓	✓	✓		✓	✓			7
Massachusetts		✓	✓	✓	✓	✓	✓	✓			7
Michigan	✓	✓	✓	✓	✓		✓		✓	✓	8
Minnesota	✓	✓	✓	✓		✓	✓		✓		7
Mississippi	✓	✓	✓	✓		✓	✓	✓	✓		8
Missouri	✓	✓	✓	✓	✓		✓			✓	7
Montana		✓	✓		✓						3
Nebraska		✓	✓	✓	✓	✓				✓	6
Nevada	✓	✓		✓				✓	✓	✓	6
New Hampshire	✓		✓		✓	✓	✓	✓	✓		7
New Jersey	✓	✓			✓	✓	✓		✓		6
New Mexico			✓	✓	✓	✓	✓			✓	6
New York	✓	✓	✓	✓	✓	✓	✓	✓		✓	9
North Carolina	✓	✓	✓	✓	✓	✓	✓	✓	✓		9
North Dakota	✓	✓		✓	✓	✓	✓	✓	✓	✓	9
Ohio	✓	✓	✓	✓	✓		✓	✓	✓		8
Oklahoma		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Oregon		✓	✓	✓	✓	✓	✓		✓	✓	8
Pennsylvania	✓	✓	✓		✓	✓	✓	✓	✓		8
Rhode Island		✓	✓		✓	✓	✓		✓		6
South Carolina	✓	✓	✓		✓	✓	✓	✓	✓		8
South Dakota	✓	✓	✓	✓	✓	✓				✓	7
Tennessee	✓	✓	✓	✓	✓	✓	✓				7
Texas	✓	✓	✓	✓	✓	✓		✓	✓	✓	9
Utah		✓		✓		✓	✓	✓	✓		6
Vermont	✓	✓	✓	✓	✓	✓		✓	✓	✓	9
Virginia	✓	✓	✓		✓	✓	✓		✓		7
Washington	✓			✓	✓		✓		✓		5
West Virginia	✓			✓	✓	✓	✓			✓	6
Wisconsin	✓	✓	✓	✓	✓	✓	✓		✓		8
Wyoming	✓	✓	✓	✓	✓	✓					6
Total	37 + D.C.	40	36 + D.C.	39	44 + D.C.	36 + D.C.	41 + D.C.	20 + D.C.	32 + D.C.	23 + D.C.	

Low scores are not intended to lead to punitive actions. Much to the contrary, this report is intended to help identify where sufficient resources have not been made available by the federal or state governments to support adequate public health preparedness and where and how states could improve or overcome obstacles to an all-hazards approach to public health preparedness. In addition, providing information about which states have particular strengths allows others to know which states to turn to for best practices and models to guide their own preparedness efforts.

The indicators in this report were selected based on:

- Reflection of a fundamental, systemic public health need;
- Consultation with key experts about areas important to serving basic public health emergency needs; and
- The availability of state level data that were verified through independent means or in consultation with states.

TFAH is only able to assess states comparatively where there are data available for all 50 states and D.C. Many states have taken action in other areas of preparedness and developed strengths or may be in the process of increasing certain capabilities not reflected in this report.

Data from these indicators were drawn from a range of publicly available sources, including CDC, ASPR, a survey conducted by the Association of Public Health Laboratories (APHL), the Office of the Civilian Medical Reserve Corps, the Association of State and Territorial Health Officials (ASTHO), public announcements from states, and interviews with government officials.

READY OR NOT? DOCUMENTS PREPAREDNESS PROGRESS

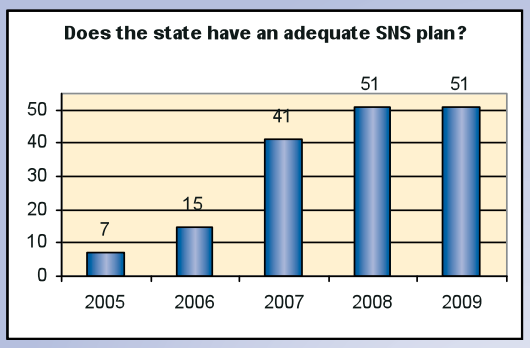
The *Ready or Not?* report has documented the significant progress that states have made in preparing for public health emergencies.

The 10 indicators are adapted annually to reflect changing expectations for preparedness and changes in the state preparedness data that are made publicly available. Updating the indicators each year allows the report to reflect a range of preparedness issues, including emphasizing what is of the highest concern in any given year, but all of the issues are considered to be important and integral parts of overall public health emergency capabilities. The report does maintain some consistency between years to help balance measuring ongoing concerns with new, revised, or highlighted concerns. For instance, in the 2009 report, six of the indicators were also used to measure preparedness in the 2008 report. And in the 2008 report, five of the indicators carried over from the 2007 report.

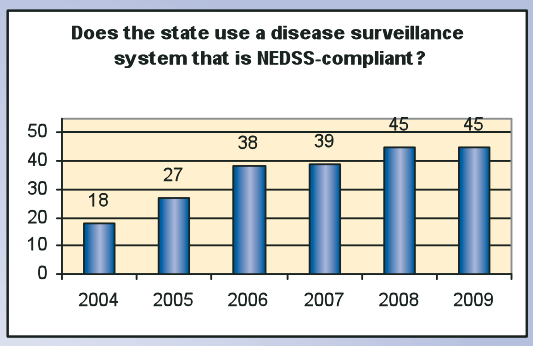
Over the course of seven years, TFAH has shown the advancements in a number of important areas, including:

- **Development of emergency response plans**
  - ▲ All states have plans in place for public health emergency response, pandemic influenza, and crisis and emergency risk communication.[9]
- **Distribution of medical countermeasures**
  - ▲ All states have developed strategies and plans to receive and distribute SNS medical supplies.[10]
- **Expansion of laboratory capacity**
  - ▲ All states have developed level three chemical lab capacity and have agreements with and access to a level one chemical lab equipped to detect exposure to nerve agents, mycotoxins, and select industrial toxins.[11]

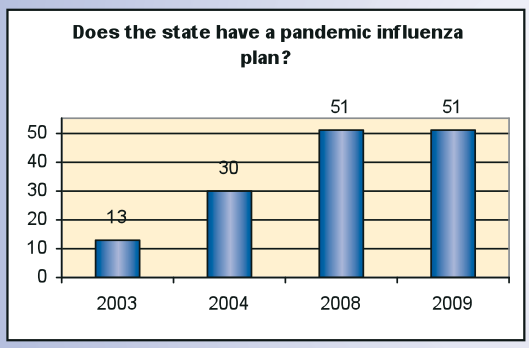
Examples of Key Areas of Progress



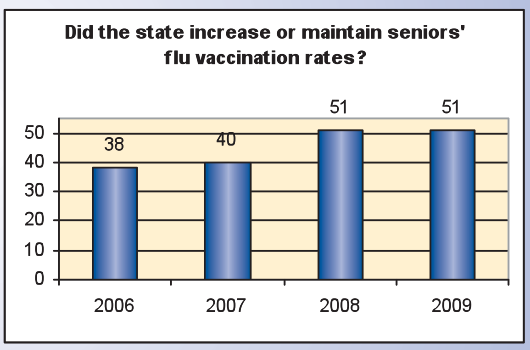
**Note: D.C. is included in the total for 2007, 2008, and 2009. **Note: In 2007, CDC switched from a green-yellow-red stoplight model of evaluating state SNS plans to a 100-point scale, where 69 and above is deemed sufficient.*



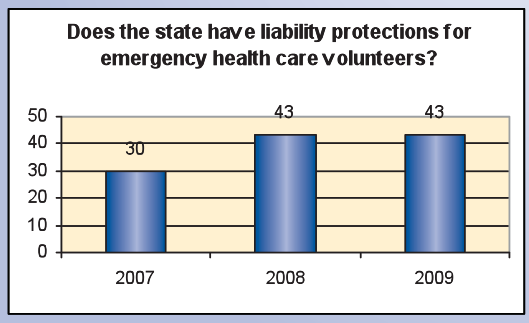
**Note: D.C. is included in the total for 2007, 2008, and 2009.*



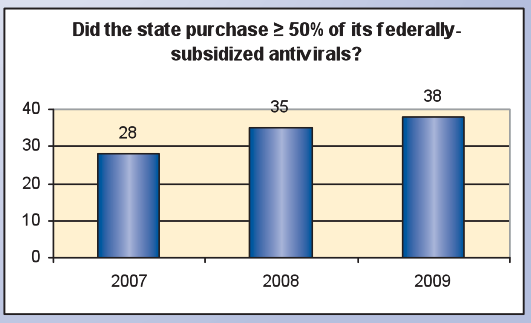
**Note: D.C. is included in the total for 2008 and 2009.*



**Note: D.C. is included in the total for 2006-2009.*



**Note: D.C. is included in the total for 2007-2009.*



**Note: D.C. is included in the total for 2007-2009.*

A. 2009 *READY OR NOT?* STATE-BY-STATE INDICATORS

Indicators	What the Indicators Measure
1. Mass Distribution -- Antiviral Stockpiling -- Did the state purchase 50 percent or more of its federally-subsidized antivirals drugs to stockpile for use during an influenza pandemic?	The federal government has declared stockpiling antivirals to be a shared responsibility between the federal government and the states. This indicator assesses the state's ability to provide antivirals to high-risk populations during an influenza pandemic.
2. Hospital Preparedness -- Hospital Bed Availability Reporting -- Does the state health department submit data to the National Hospital Available Beds for Emergencies and Disasters (HAvBED) System as required by ASPR?	This indicator demonstrates a state's ability to track hospital bed availability during a public health emergency and share that information with federal officials.
3. Public Health Laboratories -- Lab Pickup and Delivery Services -- Does the state public health lab currently have the capacity in place to assure the timely transportation (pick-up and delivery) of samples 24/7, 365 days to the appropriate public health Laboratory Response Network (LRN) reference laboratory?	This indicator reflects whether states have the capacity to deliver and receive laboratory specimens on a 24/7/365 basis.
4. Public Health Laboratories -- Surge Workforce -- Does the state public health laboratory have enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1?	This indicator demonstrates the ability of a state public health laboratory to respond to a pandemic flu or other infectious disease outbreak when the demand on the public health lab workforce is great.
5. Biosurveillance -- Does the state use a disease surveillance system that is compatible with CDC's national system, including integrating data from multiple sources, using electronic laboratory results (ELR) reporting, and using a Web-based browser?	This indicator assesses whether or not states track health threats in a manner compatible with the standards of CDC's National Electronic Disease Surveillance System (NEDSS). This system makes it possible to quickly identify and track outbreaks and share the information in a consistent way across health agencies and states.
6. Food Safety -- Detection and Diagnosis -- Did the state identify the pathogen responsible for reported food-borne disease outbreaks at a rate that met or exceeded the national average of 46 percent (combined data 2005-2007)?	This indicator reflects the ability of states to identify the pathogen responsible for food-borne disease outbreaks.
7. Medical Reserve Corps Readiness -- Do the Medical Reserve Corps units within the state meet the readiness criteria?	This indicator assesses the state MRC program on three criteria 1) the presence of a State Coordinator, 2) compliance with the National Incident Management System (NIMS) guidelines, and 3) integration with the state Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP).
8. Community Resiliency -- Children and Preparedness -- Does the state require all licensed childcare facilities to have a multi-hazard written evacuation and relocation plan and verification that laws are implemented?	This indicator looks at the extent to which the needs of children have been incorporated into state public health preparedness planning.
9. Entity Emergency Liability Protection -- Does the state have laws that reduce or limit the liability for businesses and non-profit organizations that serve in a public health emergency?	This indicator helps evaluate states' abilities to work with the private sector in the event of a public health emergency. The lack of liability protection is a serious deterrent to many businesses and non-profits that may want to offer their services but are fearful of doing so without clear liability laws.
10. Funding Commitment -- Did the state maintain or increase funding for public health programs from FY 2007-08 to FY 2008-09?	This indicator, adjusted for inflation, demonstrates states' commitment to funding public health programs, which support the infrastructure needed to adequately respond to emergencies.

1. Indicator: MASS DISTRIBUTION— STATE ANTIVIRAL PURCHASES

FINDING: Thirty-seven states and D.C. have purchased 50 percent or more of their federally-subsidized antivirals to stockpile for use during a pandemic influenza.

37 states and D.C. have purchased 50 percent or more of their federally-subsidized antivirals drugs to stockpile for use during an influenza pandemic (1 point).			**13 states have purchased LESS than 50 percent of their share of federally-subsidized antiviral drugs to stockpile for use during an influenza pandemic (0 points).**		
State	**All Antivirals Purchased by Entity as of 10/29/2009**	**Percent of Allocation Purchased***	**State**	**All Antivirals Purchased by Entity as of 10/29/2009**	**Percent of Allocation Purchased****
Alabama	533,553	112.8%	Arizona	67,717	11.6%
Alaska	90,980	133.7%	Colorado	1,215	0.3%
Arkansas	382,398	133.5%	Connecticut	22,829	6.2%
California**	2,772,922	103.2%	Florida	548,082	30.7%
Delaware	180,095	209.7%	Idaho	8,567	6.0%
D.C.	90,926	155.3%	Massachusetts	179,862	26.7%
Georgia	474,022	52.0%	Montana	8,174	8.5%
Hawaii	172,487	131.6%	Nebraska	71,952	39.4%
Illinois**	777,825	75.8%	New Mexico	77,409	39.2%
Indiana	650,912	100.0%	Oklahoma	93,765	25.5%
Iowa	312,631	101.2%	Oregon	36,668	9.8%
Kansas	286,084	100.0%	Rhode Island	38,987	34.5%
Kentucky	216,224	50.0%	Utah	71,591	29.0%
Louisiana	478,734	101.5%			
Maine	164,659	119.8%			
Maryland	582,609	100.7%			
Michigan	1,079,450	102.0%			
Minnesota	373,828	70.3%			
Mississippi	338,648	111.9%			
Missouri	600,477	100.0%			
Nevada	141,673	60.2%			
New Hampshire	68,000	50.3%			
New Jersey	880,293	97.0%			
New York***	2,444,836	121.2%			
North Carolina	677,882	76.7%			
North Dakota	57,000	85.7%			
Ohio	1,388,858	115.7%			
Pennsylvania	1,313,666	101.1%			
South Carolina	459,960	105.6%			
South Dakota	80,310	100.0%			
Tennessee	613,706	100.0%			
Texas	1,951,765	84.1%			
Vermont	71,036	109.2%			
Virginia	828,445	107.1%			
Washington	528,257	82.1%			
West Virginia	248,462	130.6%			
Wisconsin	574,763	100.0%			
Wyoming	74,826	141.9%			

Notes: States in red type have purchased more antivirals since September 30, 2008.

**The percent reflects total state antiviral purchases and may include unsubsidized state purchases, which is why some states exceed 100% of their federally-subsidized allocation.*

***The population count for California and Illinois does not include residents of Los Angeles County or Chicago.*

****New York State antiviral purchases include those made by New York City.*

A complete breakdown of federal and state antiviral purchases is available on line at http://www.pandemicflu.gov/plan/states/antivirals.html.

Source: http://www.pandemicflu.gov/plan/states/antivirals.html (accessed November 24, 2009).

When the federal government set a goal of stockpiling 81 million treatment courses of antiviral drugs for use in the event of a pandemic influenza, the main concern was the avian influenza, H5N1, circulating in Asia. No one foresaw the emergence of a novel influenza virus, H1N1, in the spring of 2009.

As the H1N1 virus spread across the globe, the World Health Organization (WHO) urged doctors to treat suspected H1N1 cases as quickly as possible with antiviral drugs, warning that the virus could cause potentially life-threatening viral pneumonia much more commonly than the typical flu, sometimes in relatively young, otherwise healthy people. "It's not like seasonal influenza," said Nikki Shindo, a medical officer in the WHO's Epidemic and Pandemic Alert and Response Department. "It can cause very severe disease in previously healthy young adults."[12]

Dr. Anne Schuchat, CDC's director of immunization and respiratory disease emphasized the need to promptly give antivirals to sick patients with underlying conditions. "The time it will take to get the lab test back shouldn't be waited for," she said. "If you have a person who is severely ill or a person with risk factors like pregnancy, asthma, diabetes, children under two, and you suspect flu, we recommend any antiviral medicines be given promptly."[13] She added that in too many instances, health care providers have delayed antiviral treatment, not realizing that rapid flu tests are notoriously inaccurate.

As of October 2009, HHS has stockpiled 50 million antivirals, 44 million of which have been allocated to states based on their population. HHS asked states to stockpile an additional 31 million treatment courses, collectively, for their populations. In order to encourage states to develop their own antiviral stockpiles, HHS is subsidizing 25 percent of the cost, while states pay the other 75 percent. Despite the subsidy program, 13 states have purchased less than 50 percent of their share of antivirals.

According to HHS, as of October 29, 2009, state and local jurisdictions have stockpiled slightly more than 25 million treatment courses of antivirals using the federal government subsidy. Twenty-five states and D.C. have purchased 100 percent or more of their federally- subsidized antivirals; 32 states and D.C. have purchased 75 percent or more; 37 states and D.C. have purchased 50 percent or more; and 44 states and D.C. have purchased 25 percent or more. Six states have stockpiled less than 25 percent of their share of antiviral treatment courses: Arizona (11.6 percent); Oregon (9.8 percent); Montana (8.5 percent); Connecticut (6.2 percent); Idaho (6.0 percent); and Colorado (0.3 percent).

TFAH awards a point on this indicator to those states that have stockpiled 50 percent or more of their federally subsidized share of antivirals. In 2008, only 34 states and D.C. earned a point on this indicator. Over the past year, Maine, Maryland, and Texas have increased their stockpiles to exceed 50 percent of their federally-subsidized antivirals.

The antivirals Tamiflu® (oseltamivir) and Relenza® (zanamivir) have been shown to reduce symptoms and help prevent the spread of seasonal influenza by suppressing the growth of the influenza virus. Antivirals differ from vaccines in that they stop the virus from replicating, while vaccines trigger an immune response in the body. Antivirals do not need to be formulated to match a specific strain of the influenza virus to be effective. As such, they can be manufactured and stockpiled in advance of a potential pandemic influenza outbreak. High-risk patients, including pregnant women and children, who contract H1N1 or show flu-like symptoms are being urged to start treatment with antivirals immediately.

States that have not purchased their entire allotment of federally-subsidized antivirals give several reasons. Some state health officials have questions their effectiveness.[14] Other states worry about the drugs' potential side effects and financial constraints. Given the current economic recession, many states are reluctant to spend resources on purchasing and stockpiling antivirals that have a limited shelf-life. Though this shelf-life recently expanded from five years to seven years, it is still too short for many state health officials.

Although TFAH recognizes these concerns, the current crisis has demonstrated the importance of having an antiviral stockpile (and the need to replenish it as it is used). Current national policy calls for the stockpiling of antivirals to be a shared federal-state responsibility. Preventing serious illness and death among those infected with H1N1 is threatened by differences in capacity among states.

MICHIGAN -- BUILDING A STRONG INFLUENZA RESPONSE USING THE BACKBONE OF PREPAREDNESS

When the first tractor-trailer trucks rolled into Michigan this past spring carrying medical countermeasures and supplies from the SNS to assist in the state's response to the H1N1 outbreak, years of planning and training by Michigan's SNS team paid off. The federal PHEP dollars had helped the Michigan SNS staff establish a seamless, comprehensive, and efficient warehousing and distribution process which has been functional throughout the 2009 H1N1 response. CDC's delivery method was neither a push-pack nor managed inventory -- two scenarios the Michigan team had trained for -- so state public health plans were quickly modified to accommodate the unexpected volume and types of materials. Within two business days of arrival the material had been inventoried, local partners queried for gaps, and shipments were on their way statewide.

The Michigan Department of Community Health (MDCH) had also used the federal funding to establish partnerships with the Michigan Pharmacists Association, Michigan Volunteer Defense Force, Civil Air Patrol (CAP), and other departments, which proved not only beneficial but timely in the response to H1N1. Utilizing the CAP, the state was able to expedite the distribution to the most remote locations in the Upper Peninsula within a very short period of time. This activity was managed through the established incident command system at MDCH Emergency Coordination Center. Efforts continue throughout the current H1N1 response, demonstrating successful communications and responsiveness to medical and public health needs statewide.

As MDCH geared up for the largest mass vaccination campaign in U.S. history, public health officials needed a way to track H1N1 vaccine administration and antiviral distribution and dispensing. MDCH turned to the Michigan Care Improvement Registry (MCIR) in the MDCH Division of Immunizations, which has been a key component for years in influenza vaccine tracking and administration. This system had been modified to include an All Hazards PHEP Module with the capability to track SNS material prior to the spring of 2009 using the federal pandemic influenza funding. The MCIR was rapidly converted to track antiviral distribution and dispensing and H1N1 influenza vaccine administration. Established policies and training programs allowed this internet-based system to be effectively used in private pharmacies, hospitals, and other physician offices where immunizations were not given routinely and where state-allocated antiviral medications were never considered. The MCIR is the lifeblood of distribution and tracking in the H1N1 medical countermeasure response.

The H1N1 response has reinforced the importance of the established dynamic surveillance systems that are in place. As such, the Michigan Disease Surveillance system (MDSS) provides real-time electronic reporting from the provider or laboratory through the local health department to the State, Bureau of Epidemiology. Constitutional complaints collected from The Emergency Department Syndromic Surveillance System collects chief complaints codes from over 88 hospital systems, which provides another critical surveillance component. The Retail Over the Counter Drug System (RODS) is another piece of the statewide surveillance puzzle that is evaluated and analyzed in conjunction with sentinel physician reporting, hospital influenza-like illness reports and school-based reporting. These federally-funded surveillance systems provide critical information to assist with the response to H1N1. Local and state health officials can monitor disease activity in their communities and target response based on those reports. Development of these systems has been costly over time, but has proven its value in response to H1N1 and other disease outbreaks.

Finally, it is impossible to capture the incredible value that the relationship building that has occurred at all levels of government and the private sector directly related to the emergency preparedness funding. Utilization of funds to meet benchmarks and deliverables often crosses the lines between the sources. From the ability to expedite communications via the Michigan Health Alert Network to the accessing of volunteers for vaccination clinics through the Michigan Volunteer Registry, the public health response has and will continue to improve based on these critical federal preparedness funds.

Source: Office of Public Health Preparedness, Michigan Department of Community Health

2. Indicator: HOSPITAL PREPAREDNESS -- HOSPITAL BED AVAILABILITY REPORTING

FINDING: Ten states and the District of Columbia do not submit weekly data for at least 50 percent of the hospitals within their jurisdiction to the National Hospital Available Beds for Emergencies and Disasters (HAvBED) System.

40 states submitted data on available beds weekly for at least 50 percent of the facilities within their state to the National Hospital Available Beds for Emergencies and Disasters (HAvBED) System as required by ASPR during the 2009 H1N1 response (1 point)		**10 states and the District did NOT submit weekly data for at least 50 percent of their facilities within their state to the National Hospital Available Beds for Emergencies and Disasters (HAvBED) System as required by ASPR during the 2009 H1N1 response (0 points)**	
Alaska	Nebraska	Alabama	Idaho
Arizona	Nevada	D.C.	Louisiana
Arkansas	New Jersey	Florida	New Hampshire
California	New York	Georgia	New Mexico
Colorado	North Carolina	Hawaii	Washington
Connecticut	North Dakota		West Virginia
Delaware	Ohio		
Illinois	Oklahoma		
Indiana	Oregon		
Iowa	Pennsylvania		
Kansas	Rhode Island		
Kentucky	South Carolina		
Maine	South Dakota		
Maryland	Tennessee		
Massachusetts	Texas		
Michigan	Utah		
Minnesota	Vermont		
Mississippi	Virginia		
Missouri	Wisconsin		
Montana	Wyoming		

Source: ASPR[15]

Hospitals that receive funding from the National Healthcare Preparedness Program at the Office of the Assistant Secretary for Preparedness and Response must meet a series of expectations, including the ability to track hospital bed availability during a public health emergency. Although hospitals may create their own systems, they must be compatible with HHS's Hospital Available Beds for Emergencies and Disasters (HAvBED) System and use the same data standards and definitions.[16] This system requires reports of available beds, including a count of available adult and pediatric general beds and ICU beds, to state and HHS emergency operations centers within four hours of request. States can submit data at the facility level (which is preferred for mapping purposes) or they can submit state-wide aggregate information. Some states have developed their own systems for situational awareness; others use the HAvBED web portal for data entry.

In 2009, HAvBED was activated three times: in the National Capital Region (NCR) for the Inauguration, for a nation-wide preparedness exercise in March, and for the 2009 H1N1 preparedness and response. Forty-nine states and the District participated in the exercise. With the second wave of the 2009 H1N1 pandemic, ASPR requested a nation-wide weekly data call for HAvBED. Since October 1, 2009 forty states submitted data weekly for at least 50% of the facilities within their states. Twenty four states – were particularly noteworthy for providing weekly data for 75% of the facilities in their states. Those states were: Arkansas, Connecticut, Delaware, Illinois, Iowa, Maryland, Michigan, Minnesota, Mississippi, Nebraska, New York, North Carolina, North Dakota, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, and Wyoming.

According to Dr. Nicole Lurie, the Assistant Secretary for Preparedness and Response, HAvBED has collected information from states about hospital status, which has enhanced the H1N1 med-

ical surge response.[17] In addition to the 'available bed' data elements reported above, the H1N1 data collection included new data elements, which were first implemented in September 2009. States are incorporating these new data elements into their existing HAvBED reporting systems to provide enhanced situational awareness. Over the first eight weeks of participation (October-November), ASPR has worked with all 50 states and the District to implement collection of the new data elements even though they are not yet required under the HPP program. Forty-one states are reporting the new data elements. This has included modifications to electronic systems, refinement of data elements and definitions, and data input/collection strategies. Many of the states currently not reporting the new data elements are waiting for their state-based data collection systems to be updated and active. ASPR is continuing to work with states on full implementation of HAvBED data reporting with a goal of full participation in 2010.

The ability for hospitals, health care providers, and health departments to track bed availability during an emergency is crucial in the event they must care for a surge of patients. ASPR, working with the Agency for Healthcare Research and Quality (AHRQ), developed HAvBED to give emergency planners a timely bed availability tracking tool. The utility of HAvBED is for all hazards, and continues to be developed to promote integrated preparedness and response across the tiers of response to include the healthcare system, the community, states, regions and the Federal government.

THE PLANNING AND DEVELOPMENT OF CRISIS STANDARDS OF CARE

*"**'Crisis standards of care'** is defined as a substantial change in usual health care operations and the level of care it is possible to deliver, which is made necessary by a pervasive (e.g., pandemic influenza) or catastrophic (e.g., earthquake, hurricane) disaster. This change in the level of care delivered is justified by specific circumstances and is formally declared by a state government, in recognition that crisis operations will be in effect for a sustained period. The formal declaration that crisis standards of care are in operation enables specific legal/regulatory powers and protections for health care providers in the necessary tasks of allocating and using scarce medical resources and implementing alternate care facility operations."*

THE INSTITUTE OF MEDICINE[18]

A mass casualty event, such as a bioterrorist attack or a severe influenza pandemic, could quickly overwhelm the health care system if large numbers of patients all sought treatment at the same time. Resources -- including staff, supplies, and space -- would be strained in the case of such an event and health care providers would face serious obstacles in attempting to provide care to patients according to normal operating procedures.

Providing care under this sort of challenging environment is not something the U.S. health care system routinely deals with, according to the Joint Massachusetts Department of Public Health-Harvard Altered Standards of Care Working Group. While "[t]he military has traditionally upheld protocols to achieve the greatest good for the greatest number during mass casualty incidents, using well-established and accepted practices for utilitarian triage to deploy resources…the patient-centered model of civilian medicine in the United States is much less familiar with such decision making."[19]

In fact, a 2008 review of state planning revealed in some detail the major challenges states and health care systems face when developing crisis standards of care. Researchers at the Center for Public Health Preparedness at the Harvard School of Public Health interviewed 33 hospital and state preparedness coordinators and identified the following challenges:[20]

- The allocation of scarce resources;
- Health care practitioner's liability during a disaster;
- Health care worker absenteeism; and
- Lack of consensus on the current guidelines for triage protocols, consistent terminology, prioritization of patients, allocation of ventilators, and others.

It is also unclear whether states should focus on developing general guidance on how health care providers should approach crisis care, or whether specific situation guidance, for example, when to use a ventilator, is needed.

To help encourage more planning and development of crisis standards of care, the IOM released *Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations* in September 2009. The report describes five key elements of crisis standards of care protocols based on a review of existing state plans, which include the following:

- A strong ethical grounding;
- Integrated and ongoing community and provider engagement, education, and communication;
- Assurances regarding legal authority and environment;
- Clear indicators, triggers, and lines of responsibility; and
- Evidence-based clinical processes and operations.

Among the states that have begun the process of planning and developing crisis standards of care are: Arizona[21], California[22], Colorado[23], Massachusetts[24], Minnesota[25], Oregon[26], Utah[27], and Virginia[28].

3. Indicator: PUBLIC HEALTH LABORATORIES -- LAB PICK UP AND DELIVERY SERVICES

FINDING: Fourteen states do not have the capacity in place to assure the timely transportation (pick-up and delivery) of samples 24/7, 365 days to the appropriate public health Laboratory Response Network (LRN) reference laboratory.

36 states and D.C. report that their public health laboratories do have courier systems (non-mail) in place to assure the timely transportation (pick-up and delivery) of samples 24/7, 365 days to the appropriate public health LRN reference laboratory (1 point).		**14 states report that their public health laboratories do NOT have courier systems (non-mail) in place to assure the timely transportation (pick-up and delivery) of samples 24/7, 365 days to the appropriate public health LRN reference laboratory (0 points).**	
Alabama	Nebraska	Alaska	Maine
Arizona	New Hampshire	Arkansas	Nevada
California	New Mexico	Delaware	New Jersey
Colorado	New York	Georgia	North Dakota
Connecticut	North Carolina	Idaho	Utah
D.C.	Ohio	Illinois	Washington*
Florida	Oklahoma	Indiana	West Virginia
Hawaii	Oregon		
Iowa	Pennsylvania		
Kansas	Rhode Island		
Kentucky	South Carolina		
Louisiana	South Dakota		
Maryland	Tennessee		
Massachusetts	Texas		
Michigan	Vermont		
Minnesota	Virginia		
Mississippi	Wisconsin		
Missouri	Wyoming		
Montana			

** Note: Washington uses a system using the postal service, Fed/Ex/UPS, and local hospital couriers.*
Source: APHL 2009 Survey of State Public Health Laboratories

Every state should have the capacity to deliver and receive laboratory specimens on a 24-hour, seven days a week basis as part of public health preparedness. Such a service, whether state-owned and operated or contracted to a designated carrier, is essential to ensure the timeliness of laboratory testing and subsequent treatment or decontamination.

According to APHL's survey of state public health laboratories, as of November 23, 2009 public health laboratories in 36 states and D.C. report having this capacity. Fourteen state public health labs do not have this capacity. Cuts in federal and state budgets have significantly impacted the ability of states to develop and maintain courier services; further budget cuts are expected due to the current economic outlook. These cuts threaten to undermine state laboratory preparedness as rapid recognition of an event requires that samples coming from first responders, clinical or other laboratories be delivered to public health laboratories without delay. Continuous sample referral and timely ground transportation are the keys to state readiness.

4. Indicator: PUBLIC HEALTH LABORATORIES -- SURGE WORKFORCE

FINDING: Eleven states and D.C. report not having enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1.

39 states report having enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1 (1 point).		**11 states and D.C. report NOT having enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1 (0 points).**	
Alabama	Missouri	D.C.	New Hampshire
Alaska	Nebraska	Georgia	New Jersey
Arizona	Nevada	Idaho	Pennsylvania
Arkansas	New Mexico	Iowa	Rhode Island
California	New York	Louisiana	South Carolina
Colorado	North Carolina	Montana	Virginia
Connecticut	North Dakota		
Delaware	Ohio		
Florida	Oklahoma		
Hawaii	Oregon		
Illinois	South Dakota		
Indiana	Tennessee		
Kansas	Texas		
Kentucky	Utah		
Maine	Vermont		
Maryland	Washington		
Massachusetts	West Virginia		
Michigan	Wisconsin		
Minnesota	Wyoming		
Mississippi			

Source: APHL 2009 Survey of State Public Health Laboratories

An article published in the journal of the Association of Public Health Laboratories (APHL) notes that during the first wave of H1N1 in the spring of 2009, "The peak public health laboratory response was unsustainable; state and federal cutbacks have drained critical surge capacity from a system already weakened by long-term workforce shortages."[29]

In the initial phases of an outbreak of a novel influenza virus, public health labs are on the front lines conducting diagnostic testing because other labs generally lack this capacity. Once the novel virus is established in the population, diagnostic testing is no longer as important and public health labs switch to surveillance testing. The surveillance testing allows public health officials to gather enough information to track the pandemic and monitor any genetic mutations or changes in the virus.

During a pandemic flu or other infectious disease outbreak, the demand on the public health lab workforce is great – and in some cases, exceeds supply. According to APHL's survey of state public health laboratories, 11 states and D.C. report not having enough staffing capacity to work five, 12-hour days for six to eight weeks in response to an infectious disease outbreak, such as novel influenza A H1N1.

If a major food-borne disease outbreak – on the scale of the 2008 salmonella contamination of jalapeño and Serrano peppers – were to occur during H1N1 pandemic, there are concerns that state public health labs would be unable to respond effectively to both crises at the same time.

Funding for public health laboratories is a major concern. Of the $600 million for pandemic preparedness that was distributed to states in FY 2006 and FY 2007, public health laboratories received little. Even the emergency supplemental signed June 24, 2009 provides very little for laboratory preparedness. Given that public health labs received no funding via the federal stimulus package there are real concerns that labs will not be able to maintain staffing capacity at a sufficient level for the remainder of the H1N1 outbreak.

PUBLIC HEALTH WORKFORCE

Public health workers are the backbone of the U.S. public health system and carry out a range of duties including epidemiologic surveillance, laboratory testing and analysis, prevention and treatment of infectious and chronic diseases, and emergency preparedness.

The public health workforce, however, is seriously strained by chronic underfunding of public health and the current economic recession, which has led to hiring freezes, travel restrictions, and forced furloughs, at a time when the nation is grappling with a major public health emergency. According to a recent survey of local health departments, 15,000 jobs have been eliminated since 2008.[30] In addition, the public health workforce is aging and it remains unclear how agencies plan to recruit the next generation of workers. According to a 2007 ASTHO survey, 24 states had 25 percent or more of their state public health workforce eligible to retire within in the next five years, while 10 states had 35 percent or more of their state public health workforce eligible. Only seven states had less than 25 percent of their state public health workforce eligible to retire within the next five years.

One of the most severe public health workforce shortages is epidemiologists, second only to public health nurses.[31] A 2005 survey of local health departments found that only 25 percent had an epidemiologist on staff.[32] Epidemiologists keep track of infectious and chronic diseases, injury, and births and deaths in communities. They collect and analyze data about potential risks to health in the community, and investigate disease outbreaks. While many epidemiologists have received advanced degrees from schools of public health, others may be trained nurses or clinicians who perform investigations of disease outbreaks without the formal training. Needless to say, without a trained epidemiology staff, conducting effective public health interventions is very difficult.

A 2006 survey by the Council of State and Territorial Epidemiologists (CSTE) reported a current total of 2,436 epidemiologists working in state health departments (50 states and D.C.).[33] The survey also found that the number of epidemiologists has grown over time -- up 40 percent from the 2001 survey. Much of the growth in the epidemiology sector is attributed to the federal emergency preparedness funding: more than one in five epidemiologists in state health departments were funded by preparedness grant monies, according to the 2006 survey.[34] There is some concern that these new hires are extremely vulnerable to shifts in federal funding, especially at a time when state public health dollars are stretched to the limits.

Also concerning, is that despite the increase in epidemiologists in the field, survey respondents also reported an estimated need for 30 percent more epidemiologists in order to fully staff all the programs.[35] This translates into approximately one epidemiologist per 100,000 population served to reach optimal capacity in state health departments.[36]

Measuring public health workforce capacity can be challenging. Unlike health care professionals who must be accredited and licensed -- thereby making it easier to count and track them -- many public health workers are trained in fields that do not provide any credentialing or licensing.

As of the publication of this report, the health reform bills before Congress contain several provisions to strengthen the public health workforce. Among the provisions are the following:

- **Public Health Workforce Recruitment and Retention Programs:** The pending Senate health reform legislation would establish a public health workforce loan repayment program to reduce critical public health workforce shortages in federal, state, local and tribal public health agencies. In FY 2010, $195 million is authorized to be appropriated for this program, and such sums as necessary for FY 2011-2015. A separate provision in the Senate bill, Grants for State and Local Programs, authorizes $60 million in grants for training of mid-career public health professionals.
- **Public Health Workforce Corps:** The House-passed bill would establish a Public Health Workforce Corps to ensure an adequate supply of public health professionals to eliminate critical public health workforce shortages. The HHS Secretary would be responsible for developing a methodology for placing and assigning Corps participants, and the methodology may allow for placing and assigning participants in state, local and tribal health departments and federally qualified health centers. The bill also establishes the Public Health Workforce Scholarship Program & Public Health Workforce Loan Repayment Program. Sec. 2235 authorizes to be appropriated money from the Public Health Investment Fund for the Corps.
- **Fellowship Training in Public Health:** The pending Senate bill would authorize funding for fellowship training in applied public health epidemiology, public health laboratory science, public health informatics, and expansion of the epidemic intelligence service in order to address documented workforce shortages in state and local health departments. The legislation authorizes $5 million to be available in each fiscal year for epidemiology fellowship training programs, $5 million for laboratory fellowship training programs; $5 million for the Public Health Informatics Fellowship Program; and $24,500,000 for expanding the Epidemic Intelligence Service.
- **Enhancing the Public Health Workforce:** The House-passed bill would establish a public health workforce training and enhancement program consisting of awarding grants and contracts for public health training programs and fellowships and traineeships for students who participate in these programs and who plan to specialize or work in the field of public health.

- **National Health Care Workforce Commission:** The pending Senate legislation establishes a commission to disseminate information on current and projected health care workforce supply and demand, including the public health workforce, health care workforce education and training capacity, retention practices for health care professionals, and recommendations on the development of a fiscally sustainable integrated workforce. The Commission shall make recommendations regarding national health care workforce priorities, goals, and policies, including recommendations concerning related policies. The finding shall be communicated to various federal departments such as HHS, DHS, Labor, Energy, and the VA. There is similar language in the House-passed bill to establish an **Advisory Committee on Health Workforce Evaluation and Assessment,** which would make recommendations on the classification of the health workforce (which is defined as including public health) and procedures to enumerate the health workforce, the supply, diversity, and geographic distribution of the workforce, the retention of the health workforce, and policies to carry out the recommendations made.
- **State Health Care Workforce Development Grants:** The pending Senate legislation would establish a competitive health workforce development grant program to enable state partnerships to complete comprehensive planning and to carry out activities leading to coherent and comprehensive health care workforce development strategies at the state and local levels. The legislation authorizes $8 million for planning grants and $150 million for implementation grants for FY 2010 and such sums as may be necessary for each subsequent year.

MASSACHUSETTS -- PHEP FUNDING AND THE DEVELOPMENT OF RISK COMMUNICATIONS CAPACITY

For the past seven years, Public Health Emergency Preparedness (PHEP) funding has played a vital role in building the planning and response capacity of the Massachusetts Department of Public Health (DPH). During the current H1N1 (swine) flu response, PHEP funding has been critical in developing additional risk communications capacity, in terms of messaging strategy, content development, development of tools for dissemination of materials, and increased coordination with public health partners at the local level.

On a capacity-building level, PHEP funding was used to create a Risk Communications Manager position which is charged with overseeing all aspects of risk communications strategy and messaging, working in conjunction with the Director of Communications and Director of Media Relations. The Risk Communications Manager played a crucial role in coordination of messaging during the initial H1N1 outbreak response in spring 2009, the development of materials in preparation for the return of H1N1 in the fall, and the rapid-response messaging as the current situation unfolds.

The Risk Communications Manager is also responsible for managing the development of all H1N1-related public information materials posted on the DPH "Flu Facts" website. The website is designed to serve as a central portal for the full range of public information materials related to H1N1 preparation and response, including guidance for health care, public health, educational, and emergency response professionals; information on flu prevention, vaccine, and treatment for the general public; and a wide variety of other materials.

DPH maintains a strong commitment to providing information for residents in a variety of languages. All materials developed for the general public are posted in at least the five non-English languages most widely spoken in Massachusetts. Basic information such as the H1N1 (swine) flu fact sheet are posted in 14 different languages besides English.

While the "Flu Facts" web pages are an important resource for both professionals and residents, DPH also maintains a blog which serves as a forum for rapid response to unfolding events, the latest on vaccine availability, and other materials to provide users with the most up-to-date information on the current situation. The Risk Communications Manager is responsible for managing the development and posting of all content to this blog and the use of ancillary social media tools such as Facebook and Twitter, which drive visitors there.

PHEP funding has also been used to support the development of risk communications capacity at the local level, in recognition of the vital role that local boards of health play in communicating with residents on flu prevention and response. On an immediate note, the Risk Communication Manager plays an ongoing consultative role with local public health communicators, continuing a dialogue on the statewide perspective on flu activity and vaccine distribution in Massachusetts and what local partners are seeing in their communities. Ideas and requests generated during these conversations help to inform the regular updates to the blog, and the development of new clinical guidance and public information materials for the "Flu Facts" website.

On a wider level, the Risk Communications Manager has developed a series of basic and advanced risk communications modules which have been provided in a variety of training venues for local public health and other emergency responders. The Risk Communications Manager has also developed a special training module on Message Mapping, which is a tool that helps public health professionals to craft simple, effective risk communications messages in response to specific public health threats. This training has been offered in a number of venues across the state and continues to be offered to local public health partners as requested.

Source: Massachusetts Department of Public Health

5. Indicator: BIOSURVEILLANCE -- NEDSS COMPATIBILITY

FINDING: Six states do not use a disease surveillance system that is compatible with CDC's National Electronic Disease Surveillance System (NEDSS).

44 states and D.C. report that they use a disease surveillance system that is compatible with CDC's National Electronic Disease Surveillance System (NEDSS) (1 point).			6 states report that they do NOT use a disease surveillance system that is compatible with CDC's National Electronic Disease Surveillance System (NEDSS) (0 points).
Alabama	Kentucky	Ohio	Connecticut*
Alaska	Louisiana	Oklahoma	Kansas*
Arizona	Maine	Oregon	Minnesota
Arkansas	Maryland	Pennsylvania	Mississippi*
California	Massachusetts	Rhode Island	Nevada
Colorado	Michigan	South Carolina	Utah*
Delaware	Missouri	South Dakota	
D.C.	Montana	Tennessee	
Florida	Nebraska	Texas	
Georgia	New Hampshire	Vermont	
Hawaii	New Jersey	Virginia	
Idaho	New Mexico	Washington	
Illinois	New York	West Virginia	
Indiana	North Carolina	Wisconsin	
Iowa	North Dakota	Wyoming	

Note: State expects to be NEDSS-compatible by late 2009/early 2010.

Source: CDC National Center for Public Health Informatics, Division of Integrated Surveillance Systems and Services

The National Electronic Disease Surveillance System (NEDSS) was developed to integrate and standardize the tracking of infectious diseases. It promotes standards-based, electronic reporting for more rapid, accurate, and integrated information. In fact, a study published in January 2008 found that automated electronic laboratory results (ELR) identified nearly five times as many cases as traditional, paper-based reporting and identified these cases nearly eight days earlier.[37] As the authors noted, "Public health monitoring of disease outbreaks, including reports of notifiable conditions from laboratories and health care providers to public health authorities, is fundamental to the prevention and control of population-based disease."[38] NEDSS facilitates the development of "…integrated surveillance systems, where the disease issues of reportable conditions in public health are tracked in an environment that allows you to see that patients who have HIV also have hepatitis C and tuberculosis, and you can take integrated public health action."[39]

According to CDC, to be considered NEDSS-compatible, states must have systems that meet the following requirements:

1. Disease data entry directly through an Internet browser-based system, thereby creating a database accessible by health investigators and public health professionals.
2. Electronic Laboratory Results (ELR) reporting, which allows labs to report cases to health departments.
3. Integration of multiple health information databases creating a single repository.

A fourth component, electronic messaging capabilities, allowing states to share information efficiently with CDC and other health agencies, is being upgraded system-wide, and is, therefore, not included among the criteria.

Disease surveillance systems have a long track record of use during outbreaks. State health departments are working to enhance disease surveillance systems and build better electronic linkages. NEDSS provides a platform to do so.

Beginning in 2004, TFAH has tracked states' compatibility with NEDSS. Six years ago, only 18 states were NEDSS-compatible; by 2009, 44 states and D.C. were NEDSS compatible. The six non-compatible states meet two of the three criteria. These states are making steady progress towards meeting the third requirement.

BIOSURVEILLANCE -- REAL-TIME SYNDROMIC SURVEILLANCE SYSTEM

Since the terror attacks of September 2001 and the subsequent anthrax mailings in October, state and local public health departments have implemented syndromic surveillance systems to rapidly detect public health threats. According to CDC, "the term 'syndromic surveillance' applies to surveillance using health-related data that precede diagnosis and signal a sufficient probability of a case or an outbreak to warrant further public health response. Though historically syndromic surveillance has been utilized to target investigation of potential cases, its utility for detecting outbreaks associated with bioterrorism is increasingly being explored by public health officials."[40]

Delivering effective public health services depends on timely and reliable information. Health departments cannot protect people from existing or emerging health threats, such as a pandemic flu, or a bioterrorist attack, without correct and pertinent information. The lack of timely and comprehensive data can delay the identification of and response to serious and mass emergency health problems. In addition, federal, state and local health departments and private health care providers must all work together to effectively track information about and respond to health threats.

Fortunately, in the United States, we rarely experience the type of bioterrorism or mass casualty events that syndromic surveillance was initially designed to help detect. However, states report that syndromic surveillance has been extremely useful for monitoring seasonal and H1N1 flu activity. In fact, according to the International Society for Disease Surveillance (ISDS) a growing body of evidence suggests that syndromic surveillance can "herald the onset of influenza seasons in advance of virus isolation by public health laboratories, provide more timely and geographically detailed information compared to information from networks of sentinel health care practices, and provide detailed, age-specific information that can characterize annual variations in the pattern of influenza morbidity."[41] (For more information on syndromic surveillance, please see Section 2: Federal Preparedness.)

In May 2007, ISDS convened representatives from CDC, the Association of State and Territorial Health Officers (ASTHO), the National Association of County and City Health Officials (NACCHO), the Council of State and Territorial Epidemiologists (CSTE), and other agencies and organizations to help ISDS develop of survey of state, local, and territorial health departments regarding syndromic surveillance practices.[42]

ISDS distributed the survey in August 2007 to 59 public health jurisdictions including all 50 states and the District of Columbia. For the survey, ISDS defined "syndromic surveillance" as systems with all of the following characteristics:

1) Surveillance for human health-related events or outcomes, including pre-diagnostic events or diagnoses;

2) Surveillance for the purpose of early event detection or situational awareness, which implies an emphasis on timeliness approaching to the extent possible "real-time" surveillance;

3) Ongoing surveillance as opposed to time-limited, "drop-in" surveillance around specific high-profile events; and

4) Surveillance systems not established primarily to support notifiable disease reporting.[43]

The survey also asked respondents about the staffing needs, cost, and utility of syndromic surveillance, in addition to plans to initiate, expand, or reduce syndromic surveillance efforts.

ISDS received responses from 52 of the 59 jurisdictions; including 46 of the 50 states, two of five territories, Chicago, the District of Columbia, Los Angeles County, and New York City. Forty-three of the 52 respondents reported conducting syndromic surveillance for a median of 3.3 years. Unfortunately, ISDS only reported the results in aggregate and did not isolate state health department responses.

In 2009, the American College of Emergency Physicians published its *National Report Card on the State of Emergency Medicine*.[44] Among the findings, 37 states and D.C. have a statewide real-time or near real-time syndromic surveillance system. However, it's not clear whether or not ACEP used the same definition as ISDS.

NEW JERSEY -- HEALTH IT FOR EMERGENCY PREPAREDNESS AND RESPONSE

In January 2009, US Airways flight 1549 carrying 169 people went down in the Hudson River between New York and New Jersey. New Jersey's response was driven in part by data collected and disseminated through the state's knowledge management/information brokerage health information technology system, HIPPOCRATES. Developed for $3 million by the New Jersey State Health Department with state dollars as well as federal PHEP grant money, HIPPOCRATES provides New Jersey with real-time health information fusion and display through static and dynamic data collection, integration, and dissemination. As a result, critical information is provided to over 3,000 users to include health, critical infrastructure, local, state, and federal partners in public and private sectors.

During the "Miracle on the Hudson" emergency, New Jersey's Health Command Center used the system to notify local, state, and federal partners including health care providers, first responders, emergency managers, and public safety officials. As information was received and verified, the duty officer entered event updates in HIPPOCRATES and new email notifications were sent with each update, with new recipients added to the notification list as needed. Update topics included: flight details, EMS staging areas, deployment of ambulances and other assets, patient health status, numbers and locations of transported patients, contact numbers, etc. New Jersey health officials were also able to use HIPPOCRATES to track hospital bed status and identify and locate ambulances transporting patients.

New Jersey has also used HIPPOCRATES to support the state's H1N1 efforts. The Healthcare System Resource Module is being used to collect and report on hospital bed availability, and the data is then reported to ASPR's HavBED system. In addition, officials can use HIPPOCRATES to monitor hospital emergency department diversion status. The Interactive Mapping Module is being used to track and display medical stockpile sites and inventories, while the Communication Channel Module is being used to compile emergency department influenza-like illness patient volume.

Additional categorical scenarios/events in which Hippocrates has been used:

- Utility incidents;
- Forest/wildland fires;
- White powder incidents (potential bioterrorism threats);
- Hazardous materials events (potential chemical exposure to population);
- Tropical storms, floods and hurricanes; and
- Hospital or nursing home evacuations.

HIPPOCRATES is used daily at the Health Command Center and nine Medical Coordination Centers to monitor and manage health-related incidents; by all of the state's acute-care facilities and Advanced Life Support (ALS) communication centers to enter real-time status updates; by local, county and regional EMS providers to monitor the availability of hospital services and equipment; and is monitored by external stakeholders including other public health agencies and federal entities such as the FBI.

During a recent power outage, HIPPOCRATES automatically notified all public health and healthcare stakeholders via email. One stakeholder, a home health agency, upon learning of the power outage through HIPPOCRATES conducted checks on their patient population and found that a home-based ventilator patient was on battery power without generator back-up. Due to the notification from HIPPOCRATES and the prompt response by the stakeholder, this patient was able to continue oxygen therapy without incident.

The system has drawn praise and attention from federal officials, as well as interest on the part of private software developers and other state health departments.

Source: Division of Health Emergency Preparedness and Response, New Jersey Department of Health

6. Indicator: FOOD SAFETY -- DETECTION AND DIAGNOSIS

FINDING: Thirty-six states and D.C. were able to identify the pathogen responsible for reported food-borne disease outbreaks at a rate that met or exceeded the national three-year average (2005-2007).

36 states and D.C. were able to identify the pathogen responsible for reported foodborne disease outbreaks at a rate that met or exceeded the national average of 46 percent (combined data 2005-2007) (1 point).				**14 states were NOT able to identify the pathogen responsible for reported foodborne disease outbreaks at a rate that met or exceeded the national average of 46 percent (combined data 2005-2007) (0 points).**			
State	**Total Confirmed Outbreaks (2005-2007)**	**Total Reported Outbreaks (2005-2007)**	**Percent of Confirmed Outbreaks (2005-2007)**	**State**	**Total Confirmed Outbreaks (2005-2007)**	**Total Reported Outbreaks (2005-2007)**	**Percent of Confirmed Outbreaks (2005-2007)**
Alaska	13	14	93%	Alabama	5	28	18%
Arkansas	7	9	78%	Arizona	15	50	30%
Colorado	56	99	57%	California	154	480	32%
Connecticut	31	41	76%	Florida	66	331	20%
Delaware	2	3	67%	Illinois	63	199	32%
D.C.	2	3	67%	Kansas	19	94	20%
Georgia	36	71	51%	Maine	30	100	30%
Hawaii	47	51	92%	Maryland	27	70	39%
Idaho	15	22	68%	Michigan	37	124	30%
Indiana	9	10	90%	Missouri	5	14	36%
Iowa	13	28	46%	Montana	2	8	25%
Kentucky	2	4	50%	Nevada	0	0	N/A
Louisiana	8	9	89%	Ohio	104	272	38%
Massachusetts	23	34	68%	Washington	41	133	31%
Minnesota	119	155	77%				
Mississippi	4	7	57%				
Nebraska	2	2	100%				
New Hampshire	10	20	50%				
New Jersey	18	30	60%				
New Mexico	4	4	100%				
New York	86	181	48%				
North Carolina	40	54	74%				
North Dakota	11	16	69%				
Oklahoma	9	14	64%				
Oregon	62	98	63%				
Pennsylvania	72	94	77%				
Rhode Island	6	7	86%				
South Carolina	30	34	88%				
South Dakota	3	4	75%				
Tennessee	45	64	70%				
Texas	21	38	55%				
Utah	10	15	67%				
Vermont	8	10	80%				
Virginia	30	33	91%				
West Virginia	2	3	67%				
Wisconsin	65	72	90%				
Wyoming	10	15	67%				

Source: U.S. Centers for Disease Control and Prevention. Annual Listing of Food-borne Disease Outbreaks, United States, 2005-2007. Available online at http://www.cdc.gov/foodborneoutbreaks/outbreak_data.htm.

Monitoring the public's food supply is a real-world example of public health preparedness as it requires the same skills and technologies needed to detect and mitigate bioterrorism and infectious disease outbreaks: a strong surveillance system and adequate lab capacity. According to Michael Taylor, Senior Advisor to the FDA Commissioner, "ensuring the safety of the food supply is centrally important to the public's health and underpins the success of the nation's trillion dollar food and agriculture industries."[45]

Approximately 76 million Americans -- one in four -- are sickened by food-borne disease each year. Many of these cases go unreported although there are an estimated 325,000 individuals who are hospitalized annually due to food-borne illness and 5,000 who die each year.[46]

CDC defines a food-borne disease outbreak as the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food. State, local, and territorial health departments report food-borne disease outbreaks to CDC each year via the electronic Food-borne Outbreak Reporting System (eFORS). CDC's goal is for 75 percent of outbreaks to have a preliminary report in eFORS within 60 days of the date the first individual became ill.[47]

Between 2005 and 2007, the last year for which CDC data was available at the time of publication, state public health departments reported a total of 3,326 food-borne disease outbreaks that sickened 67,021 individuals, down from the 3,548 outbreaks reported in the previous three-year period (2004-06) which sickened 74,077 individuals. Of the 3,326 reported outbreaks between 2005 and 2007, state public health departments were only able to confirm the etiology, or causative pathogen, in 1,542 cases, or 46 percent of outbreaks.

However, there is no mandate that dictates the type of data states submit to CDC. As seen in the table above, the quality of data reported by states varies greatly. In some states, such as California, state epidemiologists report a large number of food-borne disease outbreaks (480 between 2005-2007) and an equally large number of confirmed outbreaks (154 between 2005-2007), but still fall below the national average. Other states, like New Mexico, only reported four outbreaks over the three-year period and all four were confirmed, putting them well above the national average.

The 36 states and D.C. that earned a point on this indicator were successful at identifying the bacteria, virus, parasite, or chemical that caused the outbreak at a rate that met or exceeded the national average of confirmed food-borne disease outbreaks of 46 percent (combined data 2005-2007). In last year's report, only 30 states earned a point on this indicator – and the national three-year average was lower (44 percent) than this year's national three-year average (46 percent).

STRENGTHENING STATE AND LOCAL FOOD SAFETY

State and local health and agriculture departments are the frontline defense in our nation's food safety system, with primary responsibility for disease surveillance, response to food-borne disease outbreaks, and regulation of food safety in over one million restaurants and grocery stores. In fact, a 2009 report *Stronger Partnerships for Safer Food: An Agenda for Strengthening State and Local Roles in the Nation's Food Safety System*, notes that, "State and local agencies collectively conduct many more inspections, test many more food samples for harmful contamination, and bring many more food safety enforcement actions than the federal food safety agencies."[48] The report was produced by the Department of Health Policy at the George Washington University School of Public Health and Health Services in partnership with the organizations that represent food safety officials and practitioners at the state and local levels: the Association of Food and Drug Officials (AFDO), ASTHO, and NACCHO.

In addition to outlining the current roles of federal, state, and local agencies in protecting Americans against food-borne illness, the report makes 27 findings on the strengths and weaknesses in the current food safety system. For example, the authors note progress in how federal, state, and local agencies collaborate to detect food-borne outbreaks but also find that state and local agencies are hampered in their response to and prevention of outbreaks by lack of focused federal leadership to build an integrated system, chronic underfunding, wide disparities in capacity and diversity of practices in all areas of food safety, and barriers to information sharing and collaboration.

The report makes 19 specific recommendations for strengthening state and local roles and building an integrated national food safety system that works effectively to prevent foodborne illness. Among the recommendations is a call for increased federal funding of state and local food safety programs coupled with a recommendation that state and local governments maintain stable funding streams for their own programs. Other recommendations address disease surveillance and outbreak response and food safety regulation and inspection. The report also calls for enhanced collaboration via the establishment of a network of regional, federally-funded food-borne outbreak response centers to ensure an integrated "systems" approach to investigations to prevent far-reaching foodborne illness outbreaks.

MODERNIZING FOOD SAFETY

One of the public health programs that affects all Americans is the food safety system, a network of federal, state, and local regulatory systems that oversee production and sales of nearly all types of food. Yet, the nation is dependent on a patchwork of archaic laws, obsolete technologies, and highly variable surveillance systems to protect the food supply. Too often, food-borne illness goes unidentified and more consumers get sick while the system attempts to trace the source instead of preventing the contamination at the point of production. This weakened system can have devastating consequences. Food-borne diseases cause an estimated 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths, and lead to an annual $44 billion in lost productivity and medical costs. In addition, inaccurate identification of food-borne diseases can devastate an entire industry, as was seen by tomato growers in 2008 when a Salmonella Saintpaul outbreak was erroneously attributed to tomatoes.

2009 represented the first major steps in modernizing the federal food safety system in several decades. In July, the House of Representatives passed the Food Safety Enhancement Act, a bill which would set a minimum for risk-based inspections of food plants, give FDA the authority to recall tainted foods, and require facilities to develop comprehensive food safety plans to prevent contamination at the source. The bill passed the House with a bipartisan vote of 283-142. In November, the Senate Health Education, Labor and Pensions (HELP) Committee unanimously passed its own version of food safety legislation, the FDA Food Safety Modernization Act, but the bill has not yet reached the Senate floor. Instead of our current food safety structure, which reacts to outbreaks, these measures aim to move the nation toward a system that can prevent illness and detect contamination at early stages.

The Obama Administration has expressed strong support for revamping the federal food safety system, including endorsing the House and Senate bills. The White House has also empanelled a Food Safety Working Group to increase coordination between federal agencies, modernize food safety laws, and ensure their enforcement.

7. Indicator: MEDICAL RESERVE CORPS READINESS

FINDING: Nine states do not meet the Medical Reserve Corps readiness criteria.

41 states and D.C. have: 1) Medical Reserve Corps (MRC) State Coordinators, 2) a majority of MRC units in compliance with the National Incident Management System (NIMS) guidelines, and 3) a majority of MRC units integrated with the state Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) (1 point).			**9 states do NOT have: 1) Medical Reserve Corps (MRC) State Coordinators, 2) a majority of MRC units in compliance with the National Incident Management System (NIMS) guidelines, and 3) a majority of MRC units integrated with the state Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) (0 points).**	
Alabama	Kansas	North Carolina	Alaska	South Dakota
Arizona	Kentucky	North Dakota	Iowa	Texas
Arkansas	Louisiana	Ohio	Montana	Vermont
California	Maine	Oklahoma	Nebraska	Wyoming
Colorado	Maryland	Oregon	Nevada	
Connecticut	Massachusetts	Pennsylvania		
Delaware	Michigan	Rhode Island		
D.C.	Minnesota	South Carolina		
Florida	Mississippi	Tennessee		
Georgia	Missouri	Utah		
Hawaii	New Hampshire	Virginia		
Idaho	New Jersey	Washington		
Illinois	New Mexico	West Virginia		
Indiana	New York	Wisconsin		

Source: Office of the Civilian Volunteer Medical Reserve Corps

The Medical Reserve Corps (MRC) is a national network of community-based groups which engage civilian volunteers to strengthen public health, emergency response, and community resilience. MRC volunteers include professionals from fields such as public health, medicine, and nursing, as well as non-health professionals who work on administration, logistics, communications, and other support tasks.

The MRC network is supported by the Office of the Civilian Volunteer Medical Reserve Corps (OCVMRC), which is run out of the Office of the U.S. Surgeon General in coordination with ASPR. As of November 1, 2009 there were 191,189 volunteers enrolled in 866 MRC units in all 50 states, D.C., Guam, Palau, Puerto Rico, and the U.S. Virgin Islands.

It is recognized that local governmental services may be quickly overtaxed in a major public health emergency, and that MRC volunteers could help deliver essential medical care and other services. For example, Homeland Security Presidential Directive 21 (HSPD-21), emphasizes the need for state and local jurisdictions to have a cadre of trained volunteers who can come to the aid of their fellow community members. This presidential directive envisions a country "where local civil leaders, citizens, and families are educated regarding threats and are empowered to mitigate their own risk, where they are practiced in responding to events, where they have social networks to fall back upon, and where they have familiarity with local public health and medical systems."[49] Groups such as MRC fulfill this vision and "will significantly attenuate the requirement for additional assistance."[50]

For the 2009 report, TFAH assessed MRC units within each state on three factors:

- The presence of a state-level MRC Coordinator.
  - All states have been encouraged to appoint an MRC State Coordinator to provide recommendations to OCVMRC about new (and continued) MRC unit registrations, and to provide technical assistance and support to their local MRC units. The appointment of an MRC State Coordinator shows a level of commitment from the state to the MRC. In some states, the same individual serves a dual role as the MRC State Coordinator as well as coordinator for the Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP).
- The majority of MRC units in a state are in compliance with the National Incident Management System (NIMS) guidelines, or working towards compliance.
  - NIMS provides a consistent nationwide mechanism for federal, state, tribal, and local governments, and private sector and nongovernmental organizations to effectively work together to prepare for, respond to, and recover from emergency incidents.
  - OCVMRC has provided the following guidance to MRC units regarding NIMS (available at http://www.medicalreservecorps.gov/NIMSGuidance): "all MRC units should adopt NIMS and an ICS response structure, and have a NIMS/ICS training plan that utilizes a tiered approach to meeting NIMS compliance requirements. All MRC leaders and members must be trained in ICS-100: An Introduction to ICS, or equivalent and IS-700: NIMS, An Introduction or equivalent, and have received certificates of completion for these courses."
- The majority of MRC units in a state are integrated with the state Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) or working towards integration
  - The MRC and ESAR-VHP are national initiatives of HHS to improve the nation's ability to prepare for and respond to public health and medical emergencies. While MRC units are made up of individuals from local communities who support public health activities year-round, and are trained to respond in times of emergency, the ESAR-VHP system is primarily a means of registering and verifying the credentials of volunteer health professionals in advance of an emergency. HHS encourages integration so as to strengthen the local-state-Federal coordination of volunteers in the event of a public health emergency.

State governments can assist their MRC units, and affect community resiliency and other MRC-related outcomes, through policy, funding, and coordination. As of November 1, 2009, 41 states and D.C. met these three benchmarks, thus earning a point on this indicator.

The local MRC units are a crucial part of our nation's public health emergency response workforce. These men and women serve their communities throughout the year and are ready when needed if an emergency, such as H1N1 or a natural disaster, strikes in their communities. Ensuring a robust MRC capability provides communities with a local safety net that can be activated in times of need which increases public health resiliency and helps to further states, and our nation's national health security.

ARIZONA -- REACHING OUT TO TRIBAL GOVERNMENTS TO BUILD RESILIENT COMMUNITIES

Tribal preparedness is a significant component of overall preparedness for the State of Arizona, where nearly five percent of the population is Native American.[51] Over the past seven years, the Arizona Department of Health Services has used federal PHEP dollars to reach out to the state's tribal population, which includes coordinating with tribal leadership, local health departments, and the Indian Health Service. Arizona has also directed some of its PHEP grant money to tribal governments so they can carry out their own preparedness activities, and the state health department has a tribal liaison on staff who works through the state's inter-tribal council.

The lines of communication between state, tribal, and local health officials have been strengthened over the years, which was enormously helpful when the H1N1 flu virus hit and the state was forced to develop and implement a mass vaccination campaign in a matter of months. In addition to identifying providers and registering them to administer the vaccine, Arizona's Department of Health Services wanted to make sure the state's at-risk populations were covered. State health officials were especially concerned about tribal populations because of their higher rates of underlying conditions, including diabetes and asthma. According to Don Herrington, Acting Assistant Director for Arizona's Public Health Preparedness Services, "Given the significant tribal population in our state, we wanted to make sure they had access to the H1N1 vaccine and that locations were chosen that would be accessible to this population." To ensure tribal populations' access to the H1N1 vaccine, the state health department allocated vaccine to Indian Health Service clinics and other tribal facilities, but also coordinated with counties with large numbers of Native Americans.

Source: Arizona Department of Health Services

8. Indicator: COMMUNITY RESILIENCY -- CHILDREN AND PREPAREDNESS

FINDING: Twenty states and D.C. require all licensed childcare facilities to have a multi-hazard written evacuation and relocation plan and verification that laws are implemented.

20 states and D.C. do require all licensed childcare facilities to have a multi-hazard written evacuation and relocation plan and verification that laws are implemented (1 point).		**30 states do NOT require all licensed childcare facilities to have a multi-hazard written evacuation and relocation plan, and/or lack verification that laws are implemented (0 points).**	
Alabama	North Dakota	Alaska	Minnesota
Arkansas	Ohio	Arizona	Missouri
California	Oklahoma	Colorado	Montana
Delaware	Pennsylvania	Connecticut	Nebraska
D.C.	South Carolina	Florida	New Jersey
Hawaii	Texas	Georgia	New Mexico
Maryland	Utah	Idaho	Oregon
Massachusetts	Vermont	Illinois	Rhode Island
Mississippi		Indiana	South Dakota
Nevada		Iowa	Tennessee
New Hampshire		Kansas	Virginia
New York		Kentucky	Washington
North Carolina		Louisiana	West Virginia
		Maine	Wisconsin
		Michigan	Wyoming

Source: Save the Children[52]

Planning to care for 67 million children in American schools and child care settings during a public health emergency presents complex considerations and challenges. Children are not "small adults" and special consideration needs to be given to complicated issues ranging from child-appropriate doses of medications and vaccines, to caring for children if schools and child-care facilities are closed for extended periods. Parents and other caregivers may also become sick or injured during a disaster, complicating their ability to care for children.

In 2009, Save the Children reviewed state laws and regulations to determine to what extent the needs of children were incorporated into preparedness planning. Save the Children examined four basic emergency preparedness standards for licensed child care facilities and K-12 schools:

- **Evacuation Plan:** A law or regulation requiring all licensed child care facilities to have a multi-hazard written evacuation and relocation plan;
- **Reunification Efforts:** A law or regulation requiring all licensed child care facilities to have a written plan to notify parents of an emergency;
- **Children with Special Needs:** A law or regulation that requires a written plan for accommodating all children with special needs enrolled in a particular licensed child care facility; and
- **K-12 Disaster Planning:** A law or regulation requiring a multi-hazard disaster plan.

States were contacted when state laws or regulations were not found online or required clarification. Separate calls were made to child care licensing staff and to school personnel identifying the Save the Children project and criteria and seeking verification that the data found online was accurate.

Only seven states (14 percent) meet all four basic emergency preparedness standards: Alabama, Arkansas, Hawaii, Maryland, Massachusetts, New Hampshire, and Vermont. Nearly three-quarters of all states (37 states) require K-12 schools to have a multi-hazard disaster plan. However, far fewer states have standards for child care settings. Only 20 states and D.C. (41 percent) require all licensed child chare facilities to have a written evacuation and relocation plan, while 15 states (29 percent) require all licensed child care facilities to have a written plan to notify parents during an emergency. Less than a quarter of states (11 states) require a written plan for accommodating all children with special needs during an emergency evacuation and relocation.

Failing to plan for these worst-case scenarios puts children and adolescents at increased risk of injury and abuse.

NATIONAL COMMISSION ON CHILDREN AND DISASTERS

In December 2007, Congress created the National Commission on Children and Disasters to improve emergency preparedness and to specifically address the unique needs of children. The Commission met for the first time on October 14, 2008 to start work to make sure children become a priority in emergency planning.

The 10-member commission, which includes doctors, emergency management specialists, children's organization leaders, and legislators, delivered its first report to the President and Congress in October 2009. The Interim Report of the National Commission on Children and Disasters highlights the Commission's work over the past year and includes recommendations for federal, state, and local governments to improve our nation's readiness to protect children during a disaster.[53]

The commission broke down their recommendations into the following 11 categories.

- Disaster management and recovery;
- Mental health;
- Physical health and trauma;
- Emergency medical services and pediatric transport;
- Disaster case management;
- Child care standards;
- Elementary and secondary education disaster preparedness;
- Child welfare and juvenile justice;
- Sheltering standards, services, and supplies;
- Housing; and
- Evacuation.

The interim report stresses that children should not be grouped in with adults or with other "at-risk" or "special needs" groups, but rather are a unique group with needs that must be prioritized before, during, and following disasters. The report notes that children have continually been forced to contend with "benign neglect" and that cycle must end with planning and response specifically tailored to the needs of children.

The Commission will continue to meet for another year and then release their Final Report in October 2010.

PLUGGED IN: COMMUNICATING WITH A NEW AUDIENCE ABOUT FLU

"One of the lessons of prior influenza epidemics is the importance of timely, clear, and effective communication among government officials, medical professionals, and the public."

- President's Council of Advisors on Science and Technology (PCAST)
Report to the President on U.S. Preparations for 2009-H1N1 Influenza[54]

Effective public communication is essential in any public health disaster. A general lack of understanding or lack of knowledge about a public health event can not only fail to solve the problem, but has the potential to make a mild or moderate crisis much worse. This is especially true of an infectious disease outbreak, where, without accurate information, uninformed members of the public can pass disease on to others unwittingly or make excessive demands on health authorities and facilities when they are unwarranted. In order to make information as easy to access as possible, public health authorities are becoming increasingly web-friendly in the way they communicate with the public. In many cases, this means increasing their use of social media.

America has experienced drastic changes in the media landscape in recent years. According to the Pew Research Center for People and the Press, daily newspaper readership has declined, from 58 percent in 1994 to 34 percent in 2008.[55] Meanwhile, the practice of visiting the web for news has become more popular. In 1995, only two percent of Americans surfed news websites, but by 2008, that number rose to 37 percent.[56]

Public health authorities' methods of educating at-risk populations have followed suit. The decline of conventional media use, such as newspapers, and the rise of online communication mean that government agencies have to adapt in order to reach all at-risk populations. America saw this evolution play out in real time as the H1N1 outbreak of 2009 unfolded.

Social media has a special role in the government's response to H1N1 because of its disproportionate effect on the younger generation.[57] While the seasonal flu is usually a prime health threat to older Americans, H1N1 has proved to be a greater threat to the young. The disease is especially virulent in the population born after 1957 because that group lacks the immunity found in older people who lived through earlier, similar influenza outbreaks.[58]

Public health departments recognized the importance of communicating over the Internet immediately when H1N1 appeared in the U.S. in the spring of 2009. A study published in Health Affairs showed that the majority of health departments responded in a timely manner on their websites within 24 hours of the outbreak.[59]

However, there were some concerns that the government's media outreach was not fully engaging the web-savvy, younger audience that was most at risk. In August 2009, in anticipation of the second wave of the H1N1 pandemic, the President's Council of Advisors on Science and Technology (PCAST) wrote in its *Report to the President on U.S. Preparations for 2009-H1N1 Influenza*, "CDC's plans for public communications appear to be inadequately developed at present and somewhat behind schedule. In addition, the Group was concerned that CDC had not adequately planned to engage the full range of communications channels. Because 2009-H1N1 will particularly affect young people, there is an opportunity and need to engage new media and social networking channels."[60]

PCAST was referring to the fact that young Americans often use the internet to access information, instead of more conventional forms of media, like television or radio. According to the Pew Internet & American Life Project, 93 percent of teens (12-17 years old) go online and 65 percent use some kind of social networking site. Members of Generation Y (18-32 years old) are not far behind, with 87 percent using the Internet and 67 percent engaging in social networking.[61]

To get information to those most at risk, government agencies took a number of steps to reach out to Americans between the ages of 18-34, a group not usually targeted for flu-prevention campaigns. CDC turned to social media outlets to get their message out.[62] The agency now uses Twitter® and Facebook® to communicate about H1N1 and other public health information programs. Their Facebook® page has more than 20,000 fans.[63]

H1N1 is not the first public health crisis to push public health agencies into the world of Facebook®, Twitter®, and MySpace®, and CDC is not the only agency diversifying their media strategy in the face of H1N1. The *Washington Post* reported that health emergencies have acted as catalysts to get a number of government health agencies involved in social media campaigns. For instance, when H1N1 crossed the border, the National Institutes of Health (NIH) started using Twitter® posts to monitor the spread of the illness.[64] When the Food and Drug Administration (FDA) issued a recall after the 2009 *Salmonella* outbreak in peanut butter and peanut butter products, it set up the Twitter® account, *FDArecalls*. After the agency issued subsequent recalls for pistachios and Brussels sprouts, it gained more than 10,000 followers.[65]

But relying too much on social media can exclude some populations that must also be reached. Although more Americans are using social media than ever before, a gap in usage still exists between age groups, geographic areas. and income levels. While Americans under 63 years old boast high rates of Internet use, older generations still prefer more conventional media sources. The Silent Generation (64-72) has only 56 percent of its members online and the G.I. Generation, (73+) is only 31 percent connected.[66]

A 2009 study by the Pew Foundation's Internet and American Life Project shows that low-income individuals are also less likely to glean information and news from the web. Pew found that 85 percent of households with an income exceeding $75,000 have broadband service, while only 42 percent households earning less than $30,000 are connected to high speed access.[67] Rural residents are also experiencing a gap in service. An estimated 10 percent fewer rural residents use the Internet than their urban counterparts. In the rural South, home Internet use drops below 50 percent.[68]

Increased outreach on social and Internet -based media campaigns may be necessary to reach a younger audience. However, an over reliance on this type of media outreach may risk missing large swaths of the population that do not engage in comparable rates of Internet communication.

OREGON -- LAYING THE GROUNDWORK FOR AN EMERGENCY RESPONSE

Planning, communication, and teamwork -- these three components of public health emergency preparedness have been crucial as Oregon State's Public Health Division grapples with the ongoing H1N1 pandemic. The federal Public Health Emergency Preparedness (PHEP) grant dollars have been instrumental in building relationships between the state public health department, other state agencies, tribes, local health departments and the health care system. This investment paid off during the H1N1 outbreak when Oregon activated its public health agency operations center and officials disseminated information on the outbreak in the early days last spring. Likewise, the state was trained and able to rapidly mobilize to receive the state's share of federally stockpiled antivirals and successfully coordinated with the State National Guard, Oregon's Department of Transportation, and other public safety agencies. According to Mike Harryman, Oregon's Preparedness Manager in the Public Health Division, "We wouldn't have developed these relationships without the PHEP funding."

For example, the coordination between the Oregon Public Health Division and the 33 local health departments in the state has been crucial in this H1N1 response as it's the local health departments who are setting up mass vaccination clinics and handling a lot of the on-the-ground response. To enhance state and local collaboration on emergency preparedness, Oregon had established a master contract for all public health functions. Having this contract in place eliminated a lot of red tape and helped push the emergency federal H1N1 preparedness dollars out to the local health departments in a timely fashion, according to Harryman. "The Governor sent a letter to county officials telling them to move ahead with their H1N1 plans," he says.

The state has also worked hard to build relationships with the health care system in the state. It helps that both the PHEP cooperative agreement grants and the Hospital Preparedness Program (HPP) cooperative agreement grants are managed by the same office in the Public Health Division, which has helped in terms of coordinating the programs so that they complement each other. The state has focused on developing a communications system to link all 62 hospitals with the state health department, which includes not only building personal relationships between preparedness coordinators, but also investing in communications technology. Using both PHEP and HPP dollars, Oregon has purchased 168 satellite phones and deployed them to each local health department, hospital, and Native American tribe. "We worked with our state emergency management department," Mr. Harryman says. "We let them set the tone and then buy the equipment they recommend."

Source: State Public Health Division, Oregon Department of Human Services

9. Indicator: LEGAL PREPAREDNESS -- ENTITY EMERGENCY LIABILITY PROTECTION

FINDING: 32 states and D.C. have statutes that extend some level of immunity to businesses and non-profit organizations providing charitable, emergency, or disaster relief services, although these laws varied greatly among states.

32 states and D.C. have either enacted entity liability laws or have made a formal and official determination that existing law provides such protections (1 point).		**18 states have not adopted entity emergency liability protections or have made no formal determination under existing law (0 points).**	
Alabama[1]	New Hampshire[1]	Alaska	Missouri
Arkansas[2]	New Jersey[1]	Arizona	Montana
California[5]	North Carolina[2]	Connecticut	Nebraska
Colorado[6]	North Dakota	Hawaii	New Mexico
Delaware[1]	Ohio[1]	Illinois	New York
D.C.[1]	Oklahoma[2]	Kentucky	South Dakota
Florida[3,9]	Oregon[2,9]	Maine	Tennessee
Georgia[2]	Pennsylvania[1]	Maryland	West Virginia
Idaho[1]	Rhode Island[1]	Massachusetts	Wyoming
Indiana[7]	South Carolina[3,9]		
Iowa[2]	Texas[8]		
Kansas[9]	Utah[2]		
Louisiana[2]	Vermont[1]		
Michigan[1]	Virginia[2]		
Minnesota[2,4]	Washington[2]		
Mississippi[1,9]	Wisconsin[1]		
Nevada[1]			

NOTES:

1 Protection under existing law.

2 Enacted since 2007.

3 Administrative Arrangement in place.

4 Limits protection to a "Closed point of dispensing (POD)."

5 Statute limits the kind of legal entity that may provide emergency services. In the case of California, entity liability protection applies only to architects and engineers.

6 Statute limits the kind of legal entity that may provide emergency services. In the case of Colorado, protection applies for non-profit or hospital that is formed for the purpose of facilitating volunteer provision of health care.

7 Statute limits the role an entity may play in the emergency. In the case of Indiana, scope limited to providing health care services.

8 Based on a facial read of the plain text of the Texas statutes, there appears to be some level of immunity to groups and/or organizations providing charitable, emergency, or disaster relief services. However, interviews with the state health department's legal counsel indicate that these combined provisions do not create reliable entity liability protection under Texas state law.

9 Phone interviews with these states' legal counsel indicate that state law provides entity liability protection. However, a facial read of the plain text of the statute suggests remaining ambiguities regarding the extent to which the statute confers unequivocal entity liability.

Source: Public/Private Legal Preparedness Initiative, North Carolina Institute for Public Health, Gillings School of Global Public Health, University of North Carolina at Chapel Hill[69]

Just as volunteer health professionals will be called upon to provide treatment in a catastrophic public health emergency, so too will private sector and non-profit organizations. In fact, many state preparedness plans envision the role private companies will play in dispensing medical countermeasures in the event of a pandemic or bioterrorist attack.

A 2008 IOM workshop examined the issues surrounding the dispensing of medical countermeasures for public health emergencies, including the need for liability protection for private-sector volunteers and entities.[70] As the workshop summary report noted, "few states furnish immunity from liability to corporations and other entities when they act as Good Samaritans."[71] This is disconcerting as businesses may not be able to maintain typical quality control standards in their efforts to meet demand for resources. During declared states of emergency, legitimate concerns about liability thus could deter or delay health care professionals and entities from fully participating in relief efforts.

In assessing state law relevant to entity protections, researchers from the George Washington University School of Public Health and Health Services drew from model language and findings developed by the North Carolina Institute for Public Health as part of its Public/Private Legal Preparedness Initiative within their Good Samaritan Entity Liability Protection Initiative.[72] Key elements of this model law are as follows:

- The extension of Good Samaritan protection to business and non-profit entities acting in good faith during emergencies;
- Coverage triggered by a Governor's emergency declaration;
- Retroactive coverage that reaches pre-planning and training activities; and
- An approach to protection that extends liability to those entities working in coordination with a state agency.

For this analysis, state statutes that extend to entities what might be thought of as "property" immunity – that is, immunity with respect to injuries involving real or other property owned or controlled by an entity – are not included. This analysis focuses on protecting conduct undertaken by both business and non-profit entities during an emergency.

As of October 2009, 32 states and D.C. had extended some level of immunity to groups and/or organizations providing charitable, emergency or disaster relief services. At the same time, these statutes exhibit a certain degree of variation. For example, four states limit the role that can be played by covered entities acting under their liability protections (e.g., allowing only the provision of goods in response to a disaster). Twelve state laws require that the service provided be without compensation.

In addition, while eleven states appear to have enacted specific legislation establishing entity liability protections, the North Carolina Institute for Public Health reports that in an additional 17 states the protection is the result of a legal interpretation under existing law.[73] For example, in South Carolina, volunteer entities working with the state agency may be granted state liability insurance coverage by using two sections of the South Carolina statutes, together with the definitions contained in the existing state tort insurance contract.[74]

As with volunteer practitioner laws, the number of states addressing volunteer entity liability appears to be growing. In 2009 alone, six state legislatures enacted entity liability laws (Arkansas, Louisiana, Minnesota, Oklahoma, Oregon, and Virginia). But despite the growth of such statutes, entity liability laws remain less uniform across the states. The Uniform Emergency Volunteer Health Practitioners Act (UEVHPA) has brought a degree of uniformity to volunteer liability statutes that is lacking in the area of entity liability. Whether similar uniform legislation is merited in the case of entity liability is a matter that deserves consideration. The federal government could consider the adoption of a national standard as part of its national emergency response and preparedness plan, particularly since the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)[75] authorizes the President to pay the "allowable costs" related to certain state emergency activities. This statutory platform could be used as a uniform mechanism for federal reimbursement of claims paid under a state's tort claims act for damages against entities acting in good faith when assisting state or local governments in public health emergencies.

HEALTH CARE VOLUNTEER EMERGENCY LIABILITY PROTECTION

In the event of a catastrophic public health emergency, such as a bioterrorist attack, pandemic influenza, or natural disaster, government officials will depend on volunteer health professionals to treat the surge of patients coming forward to seek care. However, relying on volunteer health professionals presents several issues including: licensing; permissible scope of practice; the relationship between volunteers, the relief organizations, local health care, emergency management, and licensing agencies; the eligibility of volunteers for immunities from liability; and volunteers protection laws and workers' compensation benefits.

Surveys of public health and medical professionals have found that almost 60 percent of clinicians reported that having medical malpractice insurance coverage would be important (24.3%) or essential (35.4%) in their decision to travel out of state to provide assistance during an emergency. At the same time, almost 70 percent of respondents answered that immunity from civil lawsuits would be an important (35.6%) or essential (33.8%) factor in deciding whether to volunteer in an emergency.[76]

While federal laws such as the 1996 Federal Volunteer Protection Act (FVPA), the 2002 Federal Tort Claims Act (FTCA), and the 2006 Public Readiness and Emergency Preparedness (PREP) Act all provide some federal liability coverage, there is no uniform federal law that acts as a shield to liability for health care volunteers during declared public health emergencies.[77] Nor is there any uniform federal law protecting paid health care workers during an emergency, which is a concern for planners developing crisis standards of care. (Please see p. 21 of the report for more information on crisis standards of care.)

Good Samaritan laws, which exist in all 50 states and D.C., are narrow in scope and generally provide protection only for emergency aid at the scene of an emergency. Health care volunteers who provide non-emergency care at a facility following the acute phase of an emergency, for example, would likely not be protected by a state's Good Samaritan law.[78] Furthermore, a Good Samaritan statute offers only an affirmative defense in a liability action; it is not a legal grant of immunity from suit.

In response to this gap in nature and scope of legal liability protection extended to volunteers, in 2007 the National Conference of Commissioners on Uniform State Laws (NCCUSL), along with a number of health care professional organizations, developed the Uniform Emergency Volunteer Health Practitioners Act (UEVHPA). The Act offers model legislation to facilitate the deployment of health care volunteers during emergencies. The UEVHPA addresses a number of important issues, such as registration, licensing and accreditation of qualified health care volunteers for the purpose of swift and effective deployment.[79] The UEVHPA also extends civil liability protections to registered health care volunteers similar to the immunity provided to state employees under the Emergency Management Assistance Compact (EMAC), as well as provision for workers compensation.

Beginning in 2007, TFAH has tracked state legislation that extends liability to health care volunteers during a public health emergency. In 2007, 29 states and D.C. earned a point on this indicator. The following year, 42 states and D.C. earned a point.

Although TFAH did not use this measure as an indicator this year, states continue to enact new legislation extending liability protection to health care volunteers. As of November 2009, 11 states had adopted the UEVHPA, which offers the most complete immunity protections for volunteer health practitioners.

10. Indicator: PUBLIC HEALTH FUNDING COMMITMENT -- STATE PUBLIC HEALTH BUDGETS

FINDING: Twenty-seven states cut funding for public health from FY 2007-08 to FY 2008-09.

23 states and D.C. increased or maintained level funding for public health services from FY 2007-08 to FY 2008-09 (1 point)	**27 states DECREASED funding for public health services from FY 2007-08 to FY 2008-09 (0 points)**
State and percent increase (adjusted for inflation)	**State and percent decrease (adjusted for inflation)**
Alabama (11.9%)	Alaska (-1.1%)[2]
Arkansas (4.6%)	Arizona (-24.5%)
Colorado (2.9%)[6]	California (-13.9%)[5]
Connecticut (16.2%)[2]	Florida (-13.2) [2]
Delaware (2.6%)[2]	Hawaii (-0.7 %)[2,6]
D.C. (18.5%)	Indiana (-17.1%)
Georgia (10.2%)[5,6]	Kansas (-10.6%)
Idaho (5.3%)	Louisiana (-5.4%)
Illinois (3.8%)[6]	Maine (-4.0%)[2]
Iowa (1.7%)	Maryland (-2.7%)[2]
Kentucky (10.9%)	Massachusetts (-1.5%)
Michigan (2.5%)[3]	Minnesota (-7.8%)[2]
Missouri (7.2%)[5]	Mississippi (-16.0%)[2,5]
Nebraska (4.7%)[6]	Montana (-5.1%)
Nevada (7.7%)[6]	New Hampshire (-4.0%)
New Mexico (1.0%)[6]	New Jersey (-6.1%)
New York (10.1%)	North Carolina (-10.5%)[2]
North Dakota (25.5%)[4]	Ohio (-5.3%)
Oklahoma (14.0%)[1,5]	Pennsylvania (-1.2%)[2]
Oregon (12.8%)	Rhode Island (-4.0%)[6]
South Dakota (3.3%)[6]	South Carolina (-22.0%)
Texas (3.1%)[5]	Tennessee (-8.4%)
Vermont (1.6%)	Utah (-5.4%)[5]
West Virginia (16.0%)	**Virginia (-5.0%)[3]**
	Washington (-9.7%)[3]
	Wisconsin (-1.9%)
	Wyoming (-2.3%)

NOTES:
Biennium budgets are bolded.

1 May contain some social service programs, but not Medicaid or CHIP.

2 General funds only.

3 Budget data taken from appropriations legislation.

4 North Dakota's budget data for the 2007-2009 biennium taken from appropriations legislation.

5 Excludes one-time funding for antivirals.

6 State did not respond to the data check TFAH coordinated with ASTHO that was sent out 10/23/09. States were given until 11/25/09 to confirm or correct the information. The states that did not reply by that date were assumed to be in accordance with the findings.

Source: Research by TFAH of publicly available state budget documents and interviews with health and budget officials in the states.

This indicator, adjusted for inflation, illustrates a state's commitment to funding public health programs that support the infrastructure – including workforce – needed to adequately respond to emergencies.

Every state allocates and reports its budget in different ways. States also vary widely in the budget details they provide. This makes comparisons across states difficult. For this analysis, TFAH examined state budgets and appropriations bills for the agency, department, or division in charge of public health services for FY 2008-2009, using a definition as consistent as possible across the two years, based on how each state reports data. TFAH defined "public health services" broadly, including most state-level health funding.

Based on this analysis, 27 states made cuts in their public health budgets. With the current recession, states are in severe economic distress and many states have tried to close shortfalls by increasing taxes and/or cutting spending. Currently, 41 states plus D.C. are making major cuts to budgets including at least 27 states that have made cuts to public health programs.[80] At the current rate of economic deterioration, and based on the course of past recessions, the Center on Budget and Policy Priorities reports the total shortfall for fiscal year 2010 now totals $166 billion across 48 states and predicts that total gaps through 2011 will exceed $350 billion.[81]

TFAH is deeply concerned about state budget cuts and the effect they will have on state and local governments' ability to be prepared for health emergencies over the next few years. Several states that received points for this indicator may not have actually increased their spending on public health programs. The ways some states report their budgets, for instance, by including federal funding in the totals or including public health dollars within health care spending totals, make it very difficult to determine "public health" as a separate item.

Few states allocate funds directly for bioterrorism and public health preparedness as part of their public health budgets. Instead, most rely on federal funds to support these activities. The infrastructure of other public health programs, however, also supports their underlying preparedness capabilities.

While this indicator examines whether states' public health budgets increased or decreased, it does not assess if the funding is adequate to cover public health needs in the states. This also does not take into account ongoing hospital needs and funding.

(For additional information on the methodology of the budget analysis, please see *Appendix C: Data and Methodology for State Indicators.*)

KENTUCKY -- ALL HAZARDS PLANNING LEADS TO SUCCESSFUL PUBLIC HEALTH RESPONSE IN 2009 WINTER ICE STORM

For several years, the Kentucky Department for Public Health (KDPH) has been actively preparing for natural and man-made disasters by taking an "all hazards" approach to preparedness. Enabled by federal PHEP and HPP funds, public health personnel have planned for a wide variety of public health threats, in coordination with local, state, regional and federal agencies. Resources from the federal government have provided the KDPH with the ability to enhance its all-hazards preparedness capabilities by building partnerships, hiring personnel at the state and local level, developing and testing emergency response plans, creating a statewide communications network, and purchasing or leveraging a wide variety of medical and non-medical resources. All of this planning was recently put to the test during the worst natural disaster in Kentucky's modern history.

With less than 12 hours' warning, on January 27, 2009, a severe winter ice storm struck the state, leaving a large footprint: 103 of the state's 120 counties were declared disaster areas in its wake. The ice storm dealt a heavy blow to transportation, communications and public utility infrastructures in the commonwealth. Many of the roadways in parts of the state were initially impassable. Both cell and land-line telephone services were unavailable for days in the hardest hit areas. Immediately following the storm, approximately 800,000 residential and commercial units lost power, including numerous hospitals and long-term care facilities. Slowing recovery, temperatures continued to hover at or below freezing for days after the event. At the height of the response, over 200 shelters in 72 counties provided assistance to over 7,800 people. In the largest statewide call-up ever, over 4,100 National Guard members helped respond.

Anticipating the need for health and medical assistance, the KDPH took a proactive stance in the early stages of the storm and maintained a fully activated departmental Operations Center from January 28 through February 11, 2009. During this period of activation, the KDPH coordinated ESF-8 response efforts throughout the affected areas of the state and provided public health support and guidance to activated emergency operations centers, deployed Public Health Strike Teams, local health agencies, shelters, long-term care facilities, hospitals, schools, and private residences. According to Dr. William Hacker, Commissioner for Public Health, "Without our continued steady progress in the state's preparedness program, afforded through federal support, the Kentucky Department for Public Health could not have mounted such a comprehensive and successful response to the health needs of those touched by the storm."

Throughout the event, state and local health departments interacted closely with multiple levels and types of agencies to coordinate an integrated health and medical response. Pre-positioned equipment and supplies were deployed to the affected areas of the state, in order to support local health departments, hospitals, and shelters. Safety information was disseminated to the public using innovative communication methods, due the lack of television or telephone access. Satellite radios, purchased by Public Health and located in facilities across the commonwealth, allowed agencies to communicate with each other even when other systems failed. In addition, relationships developed with other southeastern states through participation in Region IV's Unified Planning Coalition allowed Kentucky to supplement its own public health team with seasoned teams of professionals from other states. Although 36 storm-related fatalities were reported, enhanced public health response capabilities -- made possible through planning, partnerships and the use of federal funds -- minimized the storm's ultimate health impact and helped preserve the health of many Kentuckians.

Source: Kentucky Department for Public Health

WYOMING -- INVESTMENT IN PREPAREDNESS PAYS DIVIDENDS WHEN H1N1 STRIKES

Since spring 2009, there have been over 3,500 cases of flu reported in Wyoming. According to Wyoming State Health Officials, federal PHEP and HPP dollars have been instrumental in developing capacity and capabilities to respond to health emergencies, like the current H1N1 pandemic. Federal dollars have been used to hire staff involved in the response, from the laboratory testing to surveillance to communications to supply distribution to planning. In addition, many of the personnel funded through the PHEP funding provide surge capacity in the laboratory and epidemiology areas, without which these areas would be more limited in their capabilities.

State health officials attribute Wyoming's success with receiving and distributing medical countermeasures to the PHEP funding, which was used to develop this capability. This would not have been possible without the funding to build the program, develop plans and coordinate with the many partners responsible for SNS activities in Wyoming. Because of this investment, Wyoming state health officials were able to ensure delivery of antiviral medications and other influenza countermeasures from CDC to local public health departments to ensure that supplies are available at the county level when needed.

Wyoming has also relied on various disease surveillance systems to keep health officials apprised of the latest developments. For example, EpiCenter collects data on emergency department (ED) admissions from nine Wyoming hospitals, while the Hospital Bed Tracking System is used to report influenza hospitalization information. With 125 reported hospitalizations from H1N1 as of November 16, 2009, the health care system has not been overwhelmed, but clear communication among health care partners remains essential. Wyoming has used the National Electronic Disease Surveillance System (NEDSS) for disease reporting, while the Wyoming Immunization Registry has been utilized to collect information on school absentee rates. The multiple systems in place provide the best information on disease activity in Wyoming and provide the best guidance to health care providers.

Source: Wyoming Department of Health

B. STRATEGIC NATIONAL STOCKPILE (SNS)

Since the first edition of the *Ready or Not?* report in 2003, TFAH has tracked states' plans to receive and distribute emergency vaccines, antidotes, pharmaceuticals, and medical supplies from the SNS. In 2003, only two states had adequate plans based on a CDC evaluation. Now, based on CDC's technical assistance review (TAR), all 50 states and D.C. have adequate plans to receive and distribute supplies from the SNS. It should be emphasized that the scoring system assesses **planning and management of the stockpile.** It does not reflect the actual capacity of the state to deploy countermeasures and other supplies from the SNS.

State and local health departments plan and train in order to: 1) receive SNS assets from the federal government; 2) distribute, or move, those assets from the storage facility to the point of dispensing (POD); and 3) dispense, or provide or administer, the medical countermeasure to the affected person(s).

It is worth noting that the CDC has changed its evaluation system, and that scores still vary greatly based on this system, ranging from a high of 100 in eight states (California, Indiana, Louisiana, Michigan, New Jersey, New York, Texas, and Virginia) to a low of 70 in Alaska and Idaho. Over the past year, the majority of states were able to increase or maintain their SNS TAR scores, although there were some exceptions. In seven states, SNS TAR scores fell between budget years.

The CDC set a goal for states to obtain a score of 69 or higher on the SNS TAR by December 31, 2008. As of November 23, 2009, all 50 states and D.C. met this goal. For the next PHEP grants budget year (August 10, 2009 to August 9, 2010), states must score 79 or higher in order to meet grant requirements.

50 states and D.C. scored 69 or higher on CDC's SNS TAR evaluation tool, indicating they have adequate plans in place to receive and distribute medical countermeasures from the SNS (2008-2009).

State	SNS TAR score (8/10/08-8/9/09)	SNS TAR score (8/10/07-8/9/08	State	SNS TAR score (8/10/08-8/9/09)	SNS TAR score (8/10/07-8/9/08
Alabama	86	92	Missouri	76	96
Alaska	70	80	Montana	96	91
Arizona	85	83	Nebraska	85	81
Arkansas	97	93	Nevada	89	84
California	100	100	New Hampshire	81	86
Colorado	96	94	New Jersey	100	98
Connecticut	94	84	New Mexico	78	71
Delaware	98	96	New York	100	97
D.C.	pending	94	North Carolina	98	93
Florida	98	95	North Dakota	83	77
Georgia	90	73	Ohio	89	90
Hawaii	84	74	Oklahoma	98	97
Idaho	70	90	Oregon	86	85
Illinois	99	96	Pennsylvania	82	82
Indiana	100	96	Rhode Island	99	93
Iowa	95	93	South Carolina	93	87
Kansas	94	93	South Dakota	91	87
Kentucky	83	86	Tennessee	89	89
Louisiana	100	94	Texas	100	97
Maine	90	90	Utah	88	85
Maryland	96	93	Vermont	98	93
Massachusetts	93	91	Virginia	100	100
Michigan	100	95	Washington	97	94
Minnesota	88	84	West Virginia	83	83
Mississippi	99	95	Wisconsin	92	86
			Wyoming	80	80

Source: CDC Division of Strategic National Stockpile. Scores for the four federally funded localities (Chicago, District of Columbia, Los Angeles County, and New York City) were not available for release when this report went to print. States with pending scores were evaluated on SNS TAR scores from the previous Budget Period 08 (August 10, 2007 to August 9, 2008).

The SNS is a national repository of antibiotics, chemical antidotes, antiviral drugs, antitoxins, life-support medications, intravenous (IV) administration equipment, airway maintenance supplies, and medical and surgical items. The SNS is designed to supplement and re-supply state and local public health agencies in the event of a national emergency anywhere and at anytime within the United States or its territories. As a condition of federal public health preparedness grants, states are required to develop a plan for the receipt and distribution of SNS contents and then exercise the plan.[82]

According to CDC, "Preparedness to receive, stage, store, and distribute SNS materiel is essential to saving lives at risk during a public health emergency."[83] For example, in a 2007 study, researchers used a computer model to illustrate the importance of rapidly receiving, distributing, and dispensing medical countermeasures in the event of a bioterrorist anthrax attack. According to the study's authors, "The number of people infected who become seriously ill can be reduced by 81 percent if mass prophylaxis is initiated two days after the release (of the anthrax) and finished two days later. If mass prophylaxis is initiated five days after the release and finished 10 days later, the number of casualties is reduced by only 39 percent."[84]

CDC evaluates states' SNS distribution preparedness plans based on a zero-to-100 point scale. The agency's TAR relies primarily on a checklist tool for evaluating SNS plans and supporting documents. The evaluation takes place over the course of one day during an on-site CDC staff visit.[85] There are 13 functions on which states are evaluated.[86]

CALIFORNIA -- BUILDING A ROBUST CAPABILITY TO RECEIVE AND DISTRIBUTE PHARMACEUTICAL AND MEDICAL SUPPLIES

California's ability to effectively respond to recent emergency events such as H1N1 influenza has been significantly strengthened by effective Strategic National Stockpile (SNS) planning. In 2003, the California Department of Public Health (CDPH) began to aggressively build a complete and robust SNS program, aided by the support and encouragement of CDPH executive management, the Secretary of the California Health and Human Services Agency, and the Governor. California's efforts culminated in California's SNS program becoming the first Project Area in the nation to achieve a perfect score of 100 from CDC on the annual State Technical Assistance Review. The same score was awarded in 2009. The effective use of Public Health Emergency Preparedness funds made this achievement possible.

The success of California's approach is based on an "all hazards" emergency management model that is NIMS compliant. CDPH formed the Emergency Pharmaceutical Services Unit (EPSU) to focus on building the State's capacity to receive, store, stage and distribute emergency medical and pharmaceutical supplies to local entities during a public health emergency. Using CDC grant funding, CDPH hired several subject matter experts as consultants to assist in this endeavor.

CDPH began by building relationships with public and private entities. CDPH developed written agreements with partner State agencies, including the California Department of Forestry and Fire Protection for Incident Command System position mentoring and access to their emergency resource directories and the California Highway Patrol for security at CDPH's Receiving, Storing and Staging (RSS) warehouse site and to provide highway escort during shipment to local health departments. In addition, CDPH entered into emergency use agreements with numerous trucking firms and multiple statewide warehouse locations for potential RSS warehouse sites.

CDPH developed a comprehensive SNS plan and a training and exercise program based on the plan. Annually, CDPH conducts a full scale warehouse exercise to test the State's ability to receive, store, stage and rapidly distribute pharmaceutical and medical supplies. Emergency response plans, including the State SNS Plan, are continually updated based on lessons learned during exercises.

In addition to bolstering the State's capabilities, CDPH works directly with local health departments to assist them in further developing their emergency plans and response capabilities. CDPH has assigned staff to provide technical assistance and mentoring on a regional basis to guide local planners.

When CDPH was called into action for the H1N1 outbreak in April 2009, the State was ready to respond. In addition to activation of its department operations center, CDPH activated the State RSS warehouse to simultaneously establish emergency operations. Operating on a 24/7 schedule, the RSS warehouse deployed approximately two million courses of antivirals statewide to local health departments in May 2009. With few exceptions, shipments were received by local health departments within 24 hours of request. Like CDPH, California's local health departments reported that previous SNS planning made it possible for them to efficiently receive, distribute and dispense antivirals.

Source: California Department of Public Health

THE STRATEGIC NATIONAL STOCKPILE (SNS)

The SNS maintains a variety of critical pharmaceuticals and medical supplies including antibiotics such as ciprofloxacin and doxycycline, chemical nerve agent antidotes like atropine and pralidoxime, antiviral drugs such as Tamiflu® and Relenza®, pain management drugs such as morphine, vaccines for agents like smallpox, as well as radiological countermeasures such as Prussian blue and DTPA. In addition to pharmaceuticals, the SNS contains supportive care supplies like endotracheal tubes and IV supplies, burn and blast supplies such as sutures and bandages, ventilators, personnel protective equipment such as N-95 respirators and surgical gloves and other life-saving medical materiel. While this list is not comprehensive, it is representative of the items contained in the SNS.

The SNS is positioned in undisclosed locations throughout the United States and is configured to provide a flexible response strategy. Included in the stockpile are a dozen 12-hour Push Packages, which contain over 50 tons of pharmaceuticals and medical materiel. These assets are pre-configured in deployable containers and strategically located to enable rapid delivery to the site of a national emergency within 12 hours of the federal decision to deploy.

The majority of the SNS formulary is maintained in managed inventory. Like the 12-hour Push Packages, these assets are also strategically located around the nation. They provide the ability to configure and deliver significant quantities of pharmaceuticals and medical materiel as an initial response if the nature of the public health emergency is well defined, or as follow-on to a "push package" delivery. Delivery of assets from managed inventory are planned to begin arriving within 24 to 36 hours after the federal decision to deploy them. Quantities in the SNS change based on national planning guidance and prioritization, modeling scenarios, and standard inventory management procedures.

According to the Office of the Assistant Secretary for Preparedness and Response (ASPR), some of the contents of the national stockpile include:

- Enough smallpox vaccine to protect 300 million people, or every man, woman, and child in America[87];
- Over 41 million regimens of countermeasures against anthrax[88];
- Therapeutic anthrax antitoxins to treat symptomatic patients[89];
- 10 million anthrax vaccine (AVA) doses[90];
- Countermeasures to address radiation exposure including 475,000 combined doses of Calcium-DTPA (Diethylenetriamine pentaacetate) and Zinc-DTPA[91]; and
- 4.8 million bottles of pediatric formulation of potassium iodide (KI) for use in the event of a release of radioiodines.[92]

The SNS also has a supply of countermeasures that could be used during an influenza pandemic. In fact, beginning with the spring emergence of H1N1, the U.S. government has been distributing both antivirals and supplies from the SNS to state and local health departments. As of November 12, 2009, the SNS contained the following countermeasures:[93]

- 36.6 million regimens of oseltamivir capsules;
- 10.3 million regimens of zanamivir;
- 20.4 million N95 respirators;
- 37.7 million surgical masks; and
- 5.4 million pediatric formulations of oseltamivir.

SNS and Children

As of November 12, 2009, there were 5.4 million regimens of pediatric antiviral formulations in the federal stockpile to treat a potential pandemic flu for the nation's 73.6 million children. Additional pediatric purchases have been made with deliveries expected in 2010.[94] For planning purposes, the federal government has assumed that antivirals would be needed for at least 25 percent of the population. This principle was applied towards pediatric population as additional pediatric formulations were purchased for the SNS.

In fact, the H1N1 influenza pandemic has affected young children at much higher rates than seniors, who are normally considered a high-risk group for seasonal influenza. Data from the first six weeks or so of the fall wave of H1N1 (CDC considers September 1, 2009 to be the start of the 2009-2010 flu season) reveal that more than half the hospitalizations -- 53 percent -- were of people under age 25. Only seven percent were of people over the age of 65. As Dr. Anne Schuchat, CDC's director of immunization and respiratory disease noted: "This is really, really different from what we see with seasonal flu." This is a "young person's disease."[95]

Given the high attack rate among young children, private pharmacies have reported shortages of liquid antiviral formulations. CDC has released some 540,000 courses of liquid Tamiflu from the SNS, and some pharmacy chains, including Walgreens and Wal-Mart, have begun breaking open adult Tamiflu capsules and mixing them with sweet syrup into pediatric formulations as indicated in the Tamilfu package insert as an alternative if commercial suspension product is not available.[96] To facilitate the pharmacists compounding of adult drugs into pediatric doses, CDC and FDA have posted guidance online. The guidelines posted also ask pharmacist and clinicians to consider alternatives to suspension formulations that includes compounding and using Tamiflu pediatric capsules (30mg and 45mg) that are not limited in supply for patients over 33 pounds and over one year of age. These capsules may be opened and mixed with a sweetened liquid by a caregiver, if the child cannot swallow capsules.

STOCKPILING AND USE OF N95 RESPIRATORS IN HEALTH CARE SETTINGS

CDC released updated guidance on pandemic H1N1 infection control in health care settings in October 2009 recommending that workers caring for H1N1 patients wear fit-tested N95 respirators -- not surgical masks -- as protection against the virus.[101] The Institute of Medicine (IOM) has seconded this recommendation, while calling for more research on flu transmission and the efficacy of different respiratory protection methods.[102]

In its updated guidance document, CDC notes that its N95 recommendation may lead to increased demand and possible shortages. "Although the exact total supply in the public and private sectors is not known, a large gap between supply and demand is predicted. In the face of shortages, appropriate selection and use of respiratory protection is critical," says CDC.[103]

Many workers find respirators uncomfortable to wear and report that they make communication with patients and other staff very difficult. An article in the Journal of the American Medical Association found that influenza rates among nurses wearing surgical masks were not significantly higher than those wearing N95 respirators, leading some to question the need to wear the N95s.[104] Meanwhile, some major labor unions, including Service Employees International Union (SEIU) the nation's largest organization of health care workers, strongly support the use of N95s when caring for a patient with suspected or confirmed H1N1.[105]

Although health care workers and their professional associations are divided over the use of N95s, industry representatives report the use of N95s in hospitals has risen dramatically as the second wave of H1N1 has picked up speed. CDC currently estimates the projected need for N95 respirators during the H1N1 pandemic to be 525 million, which is far more than the 20.4 million N95 respirators CDC had left in the federal stockpile as of November 12, 2009. Of that 525 million, the nation's 13 million health care workers would need 243 million based on current knowledge of the H1N1 pandemic. The Occupational Safety and Health Administration (OSHA), meanwhile, had previously estimated the projected need for N95 respirators during an influenza pandemic to be 4.8 billion (2.4 billion in the health care). However, this estimate was based on assumptions of a massive pandemic with an extremely virulent strain of flu virus.

According to one of the leading manufacturers of personal protective equipment (PPE), as of October 2009 state public health agencies and hospitals had stockpiled an estimated 92 million N95 respirators for use in a pandemic, with one state, California amassing some 57 million respirators.[106] This figure does not include N95s that are purchased through the regular supply chain for everyday use in hospitals and other health care settings. Between this private estimate and the federal SNS stockpile it appears that the nation has stockpiled far fewer respirators than what CDC estimates will be needed over the course of the H1N1 pandemic, or what OSHA estimated would be needed in a severe pandemic.

As some hospitals and health care systems begin to have problems meeting their own N95 needs, CDC announced on October 19, 2009 that it would distribute 75 percent of the remaining N95 respirators in the SNS to support state and local health departments with their H1N1 influenza response.[107]

A major part of the problem is that manufacturers do not have the capacity to meet the increased demand for N95s prompted by the H1N1 pandemic. Although some are adding additional manufacturing capacity, that won't be up and running for several months. According to one sales representative, "What was a six- to 12-month backlog has become a two- to three-year backlog."[108] Manufacturers are in talks with the federal government about building capacity, but even if the government decided to fund the construction of new plants, they would not be up and running for at least a year which would not help meet the demand from the second or third wave of H1N1.

If health care systems do not have enough N95 respirators for all staff, CDC recommends the careful prioritization of their use and says that personnel who do not receive respirators should be given facemasks. "Facemasks that have been cleared for marketing by the U.S. Food and Drug Administration have been tested for their ability to resist blood and body fluids, and generally provide a physical barrier to droplets that are expelled directly at the user. Although they do not filter small particles from the air and they allow leakage around the mask, they are a barrier to splashes, droplet sprays, and autoinoculation of influenza virus from the hands to the nose and mouth. Thus, they should be chosen over no protection."[109]

Given that CDC guidance recommends N95s, it may be necessary for the CDC, together with FDA and OSHA, to implement a robust education campaign for health care workers and the general public about the safety of using other PPEs for pandemic influenza infection control. More importantly, the shortage underscores the need for all health care workers to receive the seasonal and pandemic influenza vaccine every year. Only 42 percent of health care personnel receive an annual flu shot.[110] Assuring higher vaccination rates among health care workers is also about protecting patients from contracting influenza from their care providers.

SHELF-LIFE EXTENSION PROGRAM

The Shelf-Life Extension Program (SLEP) is administered by the FDA and DOD. The DOD, the Veterans Administration (VA) and CDC/SNS participate in the program.[97] DOD and SNS both maintain large stockpiles of medications and vaccines in order to ensure that both military and civilian populations have access to needed antidotes, and treatments in the event of a medical emergency. In order to save federal dollars, FDA and DOD developed a system of extending the shelf-life of these drugs beyond the manufacturer's expiration date.

The program has resulted in substantial savings. According to CDC's analysis, the return on investment for SNS participation in the SLEP is that for each dollar ($1.00) spent on SLEP costs, which includes testing, shipping, and re-labeling, SNS saved $13.00.[98]

Despite the substantial savings at the federal level, states' stockpiles of antivirals -- purchased through an HHS-subsidized program as part of states pandemic preparedness -- are not eligible. As of September 10, 2009 state and local jurisdictions have stockpiled nearly 25 million treatment courses of antivirals

In 2006, ASTHO surveyed its members regarding the stockpiling of antivirals. At the time, states indicated that inventory management, including the storage, rotation, and shelf-life extension strategies, were of critical concern.[99] State public health budgets are stretched thin already. Without a federal compromise on the SLEP, many states will be unwilling to commit scarce dollars to buy antivirals that will expire in only seven years. Although the May 2006 National Strategy for Pandemic Influenza Implementation Plan asked HHS/FDA to explore the possibility of extending SLEP to state and privately-held stockpiles, according to a 2008 IOM report, "nothing has been released about the feasibility, cost, and other barriers of extending the program to properly maintained non-federal stockpiles."[100]

C. SENIORS' SEASONAL FLU AND PNEUMOCOCCAL VACCINATION RATES

Routine vaccinations have helped prevent countless illnesses and deaths, and are extremely cost-effective, sparing the healthcare system the expense of caring for those who might otherwise become ill.

CDC's Advisory Committee on Immunization Practices (ACIP) recommends that adults aged 65 and older receive both an annual seasonal flu shot and a pneumococcal vaccine every ten years.

According to CDC, five to 20 percent of Americans contract the seasonal flu, more than 200,000 people are hospitalized from flu complications, and approximately 36,000 people die from the flu each year.[111] Certain people, such as the elderly, the very young, and those with compromised immune systems are more vulnerable to complications from seasonal flu.[112] Complications of flu can include bacterial pneumonia, dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes.

In recent years, states have made vaccinating one key high risk group, adults aged 65 and older, a public health priority. Using data from CDC's Behavioral Risk Factor Surveillance System (BRFSS), TFAH has looked at vaccination rates for this group based on three-year averages.

In 2006 and 2007, TFAH included an indicator on state public health preparedness that graded states on their ability to increase or maintain their seasonal flu vaccination rates among this target group. By 2008, all 50 states and D.C. were able to either significantly increase (18 states) or maintain (32 states and D.C.) their vaccination rates for this group. This year, when TFAH analyzed the data, we found similar results, although an even larger number of states (31 states and D.C.) were able to show a statistically significant increase in seniors' seasonal flu vaccination rates. In the other 19 states, rates held steady.

Given the importance of successful mass vaccination campaigns during a pandemic, such as the ongoing H1N1 flu, or an infectious disease outbreak or bioterror attack, it is encouraging to see the success states have had with vaccinating this high risk group. It illustrates how effective public health departments can be at reaching out to vulnerable populations and getting important health messages across.

Seasonal Flu Vaccination Rates for Adults Aged 65 and older -- Comparing 2004-2006, 2005-2007, and 2006-2008					
State	2004-2006 (three-year average)	2005-2007 (three-year average)	2006-2008 (three-year average)	2005-07 +/- 2004-06	2006-08 +/- 2005-07
Alabama	63.0%	64.0%	66.6%	1.0%	2.7%
Alaska	62.5%	62.7%	65.2%	0.2%	2.5%
Arizona	64.7%	65.7%	68.7%	1.0%	3.0%
Arkansas	67.5%	68.1%	69.9%	0.6%	1.8%
California	67.9%	67.4%	68.7%	-0.5%	1.4%
Colorado	76.3%	75.5%	76.7%	-0.8%	1.2%
Connecticut	71.8%	72.3%	73.5%	0.5%	1.2%
Delaware	68.5%	70.0%	71.2%	1.6%	1.2%
D.C.	56.9%	58.7%	60.9%	1.8%	2.2%
Florida	60.7%	60.7%	63.3%	0.0%	2.6%
Georgia	63.4%	64.5%	65.9%	1.1%	1.4%
Hawaii	73.9%	75.5%	77.1%	1.6%	1.6%
Idaho	65.1%	66.1%	67.6%	1.1%	1.5%
Illinois	62.6%	63.5%	65.9%	0.9%	2.4%
Indiana	64.5%	67.1%	68.6%	2.6%	1.5%
Iowa	73.1%	73.3%	74.9%	0.2%	1.6%
Kansas	68.9%	70.7%	72.7%	1.8%	2.0%
Kentucky	64.2%	67.3%	71.1%	3.1%	3.8%
Louisiana	65.2%	65.2%	66.9%	0.0%	1.7%
Maine	70.6%	72.3%	74.6%	1.7%	2.3%
Maryland	63.3%	65.6%	69.1%	2.4%	3.5%
Massachusetts	71.1%	73.6%	74.4%	2.4%	0.8%
Michigan	68.4%	69.8%	70.7%	1.3%	1.0%
Minnesota	76.7%	77.2%	76.6%	0.5%	-0.6%
Mississippi	64.6%	65.6%	67.5%	1.0%	2.0%
Missouri	67.7%	67.8%	71.0%	0.1%	3.2%
Montana	71.4%	71.7%	71.6%	0.2%	-0.1%
Nebraska	73.9%	74.3%	75.3%	0.3%	1.0%
Nevada	56.5%	57.7%	59.0%	1.1%	1.3%
New Hampshire	71.0%	73.3%	75.9%	2.4%	2.6%
New Jersey	65.8%	66.8%	67.6%	1.0%	0.9%
New Mexico	69.3%	68.5%	69.1%	-0.8%	0.6%
New York	64.2%	65.7%	68.7%	1.6%	3.0%
North Carolina	67.3%	68.8%	71.3%	1.4%	2.5%
North Dakota	71.9%	71.3%	72.3%	-0.6%	1.0%
Ohio	66.8%	68.5%	70.3%	1.7%	1.9%
Oklahoma	72.9%	73.3%	73.3%	0.4%	0.0%
Oregon	70.4%	71.1%	71.5%	0.7%	0.4%
Pennsylvania	63.8%	66.7%	70.9%	2.9%	4.1%
Rhode Island	71.6%	73.9%	76.2%	2.3%	2.3%
South Carolina	63.2%	64.8%	67.1%	1.5%	2.3%
South Dakota	75.8%	75.9%	75.9%	0.2%	0.0%
Tennessee	66.1%	67.4%	70.4%	1.3%	3.0%
Texas	65.0%	64.9%	68.1%	-0.1%	3.2%
Utah	72.4%	72.7%	73.9%	0.4%	1.2%
Vermont	68.6%	71.3%	73.6%	2.7%	2.3%
Virginia	68.2%	70.5%	72.5%	2.3%	2.1%
Washington	68.8%	70.2%	71.3%	1.4%	1.2%
West Virginia	65.9%	66.9%	69.4%	1.0%	2.5%
Wisconsin	72.7%	72.6%	73.0%	0.0%	0.4%
Wyoming	72.5%	73.4%	72.6%	0.9%	-0.7%

Note: Percentages are rounded to the tenth decimal place. States in red type had statistically significant ($p<0.05$) increases between three-year comparisons. No state had a statistically significant decrease over the past five years (2004-2008).

Source: BRFSS. Data include three year comparisons. Please note that each state has a different sample size so the rates of increase and decrease are not comparable across states -- each state has a different range to reach statistically significant changes. See Appendix C for the methodology.

Another priority for public health departments has been to meet the national goal of vaccinating 90 percent of adults aged 65 and older against pneumococcal disease by 2010.[113] Although states still fall far short of that goal, the majority of states (47 and D.C.) were able to increase or maintain pneumococcal vaccination rates for adults aged 65 and older in 2006-2008 compared to 2005-2007.

The ability of states to conduct successful pneumococcal vaccination campaigns took on added urgency in 2009 when the H1N1 virus first appeared. CDC reports that many people who have experienced serious and sometimes fatal complications from H1N1 flu have also been infected with streptococcus pneumoniae, a major cause of pneumonia. As such, CDC urged high-risk groups, including adults aged 65 and older and all persons aged two to 64 years with high-risk conditions to receive the 23-valent pneumococcal polysaccharide vaccine (PPSV23).

Finding: Forty-seven states and D.C. increased or maintained pneumococcal vaccination rates for adults 65 and older (comparing 2005-07 to 2006-08).

47 states and D.C. increased or maintained pneumococcal vaccination rates for adults 65 and older (comparing 2005-07 to 2006-08) (1 point)				3 states did NOT increase or maintain pneumococcal vaccination rates for adults 65 and older (comparing 2005-07 to 2006-08) (0 points)			
STATE	2005-2007 rates	2006-2008 rates	06-08 +/- 05-07	STATE	2005-2007 rates	2006-2008 rates	06-08 +/- 05-07
Alabama	62.3%	64.0%	1.7%	Louisiana	67.9%	66.3%	-1.7%
Alaska	62.4%	64.0%	1.6%	Nevada	68.5%	66.1%	-2.4%
Arizona	66.3%	68.2%	1.9%	New Jersey	64.6%	63.5%	-1.1%
Arkansas	61.9%	64.2%	2.2%				
California	60.6%	61.0%	0.5%				
Colorado	71.8%	72.6%	0.7%				
Connecticut	67.4%	66.6%	-0.8%				
Delaware	68.0%	70.0%	2.0%				
D.C.	53.2%	54.4%	1.2%				
Florida	62.8%	62.4%	-0.3%				
Georgia	63.1%	64.0%	0.9%				
Hawaii	68.0%	67.9%	-0.2%				
Idaho	63.6%	64.7%	1.1%				
Illinois	59.5%	59.6%	0.1%				
Indiana	65.8%	66.9%	1.1%				
Iowa	69.8%	70.1%	0.3%				
Kansas	68.3%	68.5%	0.2%				
Kentucky	64.5%	65.2%	0.7%				
Maine	67.8%	70.5%	2.6%				
Maryland	64.6%	66.1%	1.6%				
Massachusetts	69.0%	69.6%	0.7%				
Michigan	65.8%	65.8%	0.0%				
Minnesota	71.0%	70.8%	-0.2%				
Mississippi	66.6%	66.8%	0.2%				
Missouri	66.3%	67.3%	1.0%				
Montana	71.4%	71.2%	-0.2%				
Nebraska	69.4%	70.2%	0.9%				
New Hampshire	70.1%	71.2%	1.1%				
New Mexico	64.1%	64.6%	0.5%				
New York	62.2%	63.3%	1.1%				
North Carolina	68.0%	68.8%	0.8%				
North Dakota	70.5%	69.4%	-1.1%				
Ohio	66.7%	68.4%	1.8%				
Oklahoma	71.0%	71.1%	0.1%				
Oregon	73.4%	73.2%	-0.2%				
Pennsylvania	68.6%	69.7%	1.2%				
Rhode Island	72.1%	71.8%	-0.3%				
South Carolina	63.8%	64.0%	0.3%				
South Dakota	65.0%	64.7%	-0.3%				
Tennessee	65.2%	65.4%	0.2%				
Texas	63.1%	63.7%	0.6%				
Utah	67.1%	68.0%	0.9%				
Vermont	67.8%	69.0%	1.1%				
Virginia	67.7%	68.1%	0.4%				
Washington	69.1%	70.0%	0.9%				
West Virginia	67.0%	66.9%	0.0%				
Wisconsin	69.0%	70.5%	1.5%				
Wyoming	71.0%	70.3%	-0.8%				

Note: States in red type had statistically significant ($p<0.05$) increases and/or decreases ($p<0.05$).

Source: BRFSS. Data include three year comparisons. Please note that each state has a different sample size so the rates of increase and decrease are not comparable across states -- each state has a different range to reach statistically significant changes. See Appendix C for the methodology.


AMBULANCE
EMERG. MEDICAL TECH
5

Federal Preparedness

SECTION 2

In this section of the report, TFAH examines federal preparedness activities, which have been developed to help the country prepare for a range of potential health emergencies that we might face, ranging from bioterrorism to natural disasters to major disease outbreaks.

This past year, public health preparedness in the United States and around the world has been tested by the emergence of the novel A/H1N1 strain of the flu. The outbreak has posed serious challenges, but the strain of the virus has been relatively mild. What H1N1 has shown is that if the virus had become more severe, our nation's public health safety system could have been stretched beyond the breaking point.

In order to have a strong, public health system that can respond to threats, whether they are man-made or naturally occurring diseases and disasters, the federal government needs to ramp up policies and investment to strengthen our core public health system.

While federal preparedness policy has evolved over the past seven years with the passage of major legislation and a renewed focus on accountability and transparency, a review of federal policies by TFAH finds that the federal government continues to lag in several key areas:

- **Funding:** The U.S. Congress has failed to deliver a sustained financial commitment towards preparedness – especially at the state and local level where many of the essential preparedness and response activities occur. While the President and Congress should be applauded for providing more than $7.7 billion in emergency supplemental funding to respond to the H1N1 outbreak this fall, with a bulk of that funding going toward the development and purchase of vaccines, we cannot be prepared for the range of threats we as a nation face when we rely on a band aid approach to funding emergency preparedness;
- **National Stockpiles:** The President and Congress need to plan for the replenishment of the Strategic National Stockpile (SNS). In addition to the antivirals distributed to fight H1N1, other medical countermeasures in the SNS are beginning to pass their shelf-life expiration date. Current legislation, however, does not allow for replenishing the stockpile, nor does it factor in the storage, security, and maintenance costs associated with the SNS; and
- **Biosurveillance:** Real-time disease detection and surveillance is crucial for a well-prepared public health and medical response system. While there has been an increased focus on biosurveillance and the need to coordinate across government agencies, the nation's human health surveillance systems remain a patchwork.

Issues addressed in this section include:

A. H1N1 preparedness and response;

B. Funding for pandemic and all-hazards preparedness and funding for core public health capacity

C. National stockpiles and development of medical countermeasures;

D. Real-time disease surveillance systems and health information technology;

E. Implementation of the 2006 Pandemic and All Hazards Preparedness Act (PAHPA); and

F. Emergency care issues.

A. H1N1 PREPAREDNESS AND RESPONSE

This report comes out at a time the nation is grappling with a major public health event: the second wave of H1N1. The novel virus emerged in April 2009 and rapidly spread around the globe, hospitalizing tens of thousands and killing thousands more. Although outbreaks of H1N1 continued across the United States this past summer, it wasn't until late August/early September that a significant increase in cases occurred. The widespread flu activity this fall has been unprecedented, and federal, state, and local public health departments continue to work around the clock to develop and implement mass vaccination plans, medical surge plans, and communication campaigns.

Fortunately, the country is much better prepared to face a pandemic than it was just a few short years ago. The investments that have been made over the past several years to improve pandemic preparedness have resulted in significantly enhancing the country's ability to respond to an influenza pandemic. These investments have increased the country's vaccine manufacturing capacity, provided helpful awareness and education campaigns, contributed to a more robust federal stockpile of antiviral medications, improved many core public health functions, and assisted in the development of federal, state, local, community, business, and school pandemic plans. Since 2005, a strong National Strategy for Pandemic Influenza has been developed, and every state has a pandemic plan, which is constantly being revised and refined.

However, there also have been many concerns which were not adequately addressed or funded before 2009. These included the need to modernize and strengthen, in a sustained way, much of the public health infrastructure, how best to manage surge capacity during a mass event, and developing a reimbursement system for uncompensated care during an emergency. In addition, proir to this year, policies called for many preparedness functions to be state and local responsibilities without provision of federal support for these needs, including the expectation that states would purchase a significant portion of antiviral medications to protect their own citizens.

The federal government has been able to address some of these underlying issues in the short-term as they grapple with the H1N1 pandemic, but longer-term solutions are needed. Some key areas of concern that were underscored by the H1N1 outbreak include:

- Vaccine distribution and the intersection of public health and clinical care;
- Payment for the administration of vaccines; and
- Surge capacity, including offsite diagnosis.

Vaccine distribution and the intersection of public health and clinical care

After the initial H1N1 outbreak, the United States immediately started preparing for H1N1 vaccinations. In mid-September, the U.S. Food and Drug Administration (FDA) cleared vaccines from Sanofi-Aventis SA, CSL Ltd, Medimunne, and Novartis AG to help prevent H1N1. A fifth, from GlaxoSmithKline, was approved in November. The near-term availability of sufficient pandemic vaccine, albeit slower than hoped for initially, is due to an investment that began in FY2006, when Congress approved $3.2 billion for advanced development, infrastructure building, and purchase of vaccines.[114] The federal government invested in retrofitting and expanding capacity in vaccine manufacturers that had domestic production facilities – MedImmune and sanofi pasteur —and ensuring a year-round supply of eggs.[115] In fact, the Untied States moved as fast as or faster than any other country in the world. The United Kingdom, for example, just began its vaccination campaign the last week of October – even though there is more vaccine production capacity in the United Kingdom than in the United States. Between May 22, 2009 and September 21, 2009, HHS purchased some $2.25 billion worth of H1N1 vaccine and adjuvant.[116] The vaccine is well matched to the circulating virus and it is proven to be safe and effective in clinical trials.

When vaccines were first distributed in early October, there were reports that medical care providers were unfamiliar with the government's plan to distribute the vaccine. At the same time, many private practices were inundated with calls from patients seeking the vaccine.[117]

As of November 20, 2009, the U.S. government had shipped 46.2 million H1N1 vaccine doses to the 62 Public Health Emergency Response (PHER) project areas, including all 50 states and four major metropolitan areas; Chicago, the District of Columbia, Los Angeles County, and New York City.[118]

Unlike a bioterrorist attack, where the public health system would likely be the sole distributor of the medical countermeasure, the H1N1 flu pandemic required the public health and clinical care systems to work together in order to reach as many Americans as possible. State pub-

lic health departments created vaccination plans, which included identifying locations where the public was directed to receive vaccinations. These locations varied by state and included health care providers, community health centers, pharmacies, and/or state and local health departments. In some cases, health departments set up special vaccination centers in shopping malls or even drive-thru stations. States provided CDC with vaccine orders, and CDC contracted with the McKesson Corporation to distribute vaccine directly to the approximately 150,000 locations the states identified. Vaccines were distributed with medical supplies (syringes and sterilization swabs), in accordance with state plans.

The policy decision designating the federal government as the central purchaser and distributer of vaccine was wise from both public health and ethical standpoints. Centralization has permitted the federal government to control the flow of the limited supply. Every state is receiving vaccine on a per capita basis, rather than based on private ordering, state budgets, population demographics, or political decision-making. An influenza outbreak does not acknowledge or respect state borders, and no American should be less protected based on where he/she lives. Although all states are temporarily experiencing shortages, all states are suffering shortfalls equally. The situation is not always as clear on the local level, where distribution within states appears uneven in some cases.

This is not to say that there have not been glitches in this centralized system. But as best TFAH can determine, federal health officials have moved as rapidly as possible to address the problems.

While the federal government has assumed centralized responsibility for vaccine distribution to state and local health departments, each locality is then responsible for developing its own policies and systems for administration of vaccine as it becomes available. This has posed a number of important challenges, particularly in a context of changing messaging resulting from shortages of both seasonal and H1N1 vaccines:

- First, state and local health officials received constantly shifting information about how much vaccine would be available and when. This makes setting parameters for vaccine administration very difficult. It is nearly impossible to know why the communications breakdown between federal officials and industry occurred with regard to the pace of production. But this is clearly an issue that has not only created confusion among the American people; it has also made the job of local health officials far more difficult in an already challenging situation.
- Second, the largest mass vaccination campaign in U.S. history is taking place during an economic recession and when state and local health departments are experiencing devastating budget and staff cuts. According to a survey by National Association of County and City Health Officials (NACCHO), 15,000 positions have been lost in local health departments since the beginning of 2008.[119] Meanwhile, a survey by the Association of State and Territorial Health Officials (ASTHO) found that 40 percent of states expected to lose staff through layoffs or attrition in FY2009.[120] While the federal government has rapidly pumped almost $1.5 billion to state and local health departments for pandemic response, this does not address the underlying decline in the core capacity of health departments. We are seeing the result of decades of under-investment in public health capacity. It cannot be rebuilt on an emergency basis.
- Third, public confusion may well have been exacerbated by the fact that each state and locality has determined how to distribute its supply once it was received from the federal government. While all jurisdictions have kept to the general prioritization of certain populations, they have often acted differently in terms of which individuals within the prioritized grouping would get vaccine first. This may well have been due to how supply was ordered by the states and/or distributed within the states. For example, some localities have prioritized health care workers, some have prioritized the vaccination of children, and still others have made pregnant women a top priority. Population demographics differ from state-to-state, so it is sensible to allow some flexibility between locales (for example, if the pandemic had targeted seniors, Arizona and Florida may have very different distribution plans than other states). However, the variation in distribution methodologies has created a fair amount of confusion among the public. Although each health department based their plans on a larger supply of vaccines, HHS may want to revisit this issue and consider some standardization in future emergencies since it is not unreasonable for the American people to expect some level of consistency in approach. Otherwise, they may think that the target population hierarchies articulated by the federal government are not science-based.

A number of experts believe there will likely be a third wave of H1N1 that may occur in the United States in the winter or spring, so even after this winter's flu season subsides, many public health professionals recommend that the vaccination campaign continue to protect people for the future.

VIRGINIA -- PUBLIC HEALTH RESPONSE TO H1N1

As the second wave of the H1N1 outbreak picked up steam in August 2009, Virginia state health officials had three main priorities: the distribution of medical countermeasures, including H1N1 vaccines; handling increased patient volume at hospitals, community health clinics, and private practitioners' offices, and providing accurate, useful, prudent and timely information to the general public as well as focused messages to key communities.

According to Bob Mauskapf, Director, Emergency Operations, Planning and Logistics for the Virginia Department of Health (VDH), planning and preparing for the distribution of medical countermeasures -- including the handling of mass vaccinations and antivirals -- was a key focus of the federal Public Health Emergency Preparedness grant to the state. "This was a preparedness benchmark that we spent a lot of time and energy on and we've seen the pay off this fall," he said.

Over the past several years Virginia had built up its stockpile of antiviral drugs, which if taken within 48 hours of the onset of flu symptoms, can lessen the severity of the illness. Although the state hasn't had any reports of antiviral shortages from private pharmacies, VDH wanted to make sure that uninsured and underinsured Virginians had access to antivirals. VDH mobilized their SNS team and distributed 50,000 treatment courses of Tamiflu to local health departments and free clinics. In addition, VDH released all 15,000 treatment courses of pediatric oral suspension antiviral formulations they had received from the SNS to children's hospitals and pharmacies. According to Mauskapf, the success of this deployment of countermeasures from the SNS was the result of partnerships built over the past seven to eight years with various business entities, including a major pharmacy warehousing and distributing center and the United Parcel Service (UPS.) "Where would we be without the training in logistics paid for by the PHEP grants? [Logistics] isn't a core competency of public health but it's something that we've trained on over the past several years and it has proven to be essential to this H1N1 response," he said.

State health officials and medical providers were also able to draw upon the capabilities developed via the federal investments in hospital preparedness. The Hospital Preparedness Program (HPP) funding has enabled Virginia to develop and maintain a network of mutually supporting health care regions, hospitals, federally-qualified health centers (FQHCs), long-term care facilities (LTCFs), free clinics, and other health care entities. Of particular note has been the establishment of a state Healthcare Emergency Management Committee and six Hospital Regions, each with a primary and a secondary Regional Healthcare Coordinating Center and a dedicated Regional Hospital Coordinator. This has enhanced communications, interoperability, mutual support, patient diversion, and coordinated surge operations. Fortunately, there have only been a few spot reports around Virginia of hospitals that implemented surge plans.

However, private practitioners and local public health departments have been overwhelmed by people seeking information about the H1N1 vaccine. In order to help ease this burden, VDH instituted a Public Health Information Center (PHIC)/Call Center staffed by employees hired with the federal emergency supplemental H1N1 funding. The call center is staffed with a mixture of clinicians, nurses and subject matter experts who can answer email or take a phone call that can't be fielded by a lay person. The call center greatly reduced local health department call volumes so that they could more appropriately direct local resources toward other pressing operations, such as disease surveillance and investigation of suspected H1N1 cases. According to VDH, the call center was fielding 750 calls per week through the end of October, although in early November that dropped to 400 calls per week.

As the supply of H1N1 vaccine steadily increases and priority populations are immunized, VDH officials are planning for a mass vaccination campaign that will target the general public. As Mauskapf notes, "It's not our imagination that's holding us back but the logistics of getting enough vaccine."

Source: Virginia Department of Health

Vaccines and payment issues

Federal role

The President's declaration of a public health emergency – as in the case with the current H1N1 pandemic – makes possible the federal purchase and nationwide distribution of free vaccine. But even when vaccine is distributed free of charge, its administration poses costs to physicians, health departments, and schools.

The hybrid public-private vaccine delivery system in the United States further complicates the distribution and administration of vaccines. The health insurance system is comprised of thousands of separate coverage arrangements governed by multiple laws that lack common content or coverage and payment requirements. Three major insurance issues surround H1N1 immunizations. These issues may create barriers that deter low-income families and individuals from seeking immunizations. The concerns include:

- Determining whether an insurance provider will require a co-pay or deductable for receiving an H1N1 immunization;
- Making it easy for providers to bulk bill insurance companies or government insurance providers for payment though a method called roster billing, instead of filling out individual paperwork claims for every single patient; and
- Allowing for out-of-network coverage, so that patients can go to available locations administering vaccines without concern for whether they are part of their official insurance network.

The federal government has direct oversight responsibilities for certain health insurance arrangements and can set policies for these programs, including Medicare, Medicaid, and the Children's Health Insurance Program (CHIP). In addition, the federal government plays a key oversight role in the case of health benefit plans covering the federal civilian and military workforce (Office of Personnel Management (OPM), the Department of Veterans Affairs (VA), and the U.S. Department of Defense (DOD)). HHS and the U.S. Department of Labor (DOL) also oversee the state regulated insurance market for both small group and individual coverage as a result of the Health Insurance Portability and Accountability Act (HIPAA). DOL oversees the administration of health benefit plans offered by private employers. As of 2009, around 60 percent of private employers sponsored health benefit plans for their employees.[121] Virtually all of these plans operate under the authority of the Employee Retirement Income Security Act (ERISA). Finally, the Internal Revenue Service (IRS) oversees the awarding to tax-free status to the 2,900 non-governmental, nonprofit hospitals in the United States, which includes requiring these hospitals meet defined "community benefit" standards.

An analysis TFAH commissioned from researchers at the George Washington University School of Public Health and Health Services determined the federal agencies could take the following actions to help improve vaccine administration issues:

- Medicaid should update their policies around roster billing and out-of-network issues. They should clarify that their policies should provide coverage for administration of the vaccine and out-of-network medical care related to H1N1 and allow for roster billing. The program covers 60 million individuals including the nation's most vulnerable low-income and medically high-risk individuals. H1N1 vaccine administration is covered for children enrolled in Medicaid through the early and periodic screening, diagnostic and treatment benefit (EPSDT).
- DOL has the ability to communicate with ERISA-governed health benefit plans offered by private employers to encourage them to provide information to all of their beneficiaries about the importance of getting vaccinated; waive co-pay requirements for vaccinations; and waive out-of-network restrictions for vaccinations; and provide state and local public health departments with information about vaccination rates and progress to the extent covered by law (ERISA does not pre-empt public health reporting requirements).
- OPM and DOD can also communicate with the contractors that manage their health plans to encourage that they provide information to all of their beneficiaries about the importance of getting vaccinated; waive co-pay requirements for vaccinations; and waive out-of-network restrictions for vaccinations; and provide state and local public health departments with information about vaccination rates and progress to the extent covered by law.
- The U.S. Treasury Department, of which the IRS is one of the divisions, could remind nonprofit hospitals that immunization is a key community benefit and encourage that they actively work to provide vaccines to the community and extend hours and their workforce to help state and local health departments with community vaccination efforts. The IRS found has found that in the past, nearly one in two nonprofit hospitals spent nothing on immunizations, and for those who did, many may have charged for the care.[122]

In the long-term, the federal government should mandate that all health insurers – including the federally-run plans – cover seasonal and pandemic flu shots, regardless of the where they are administered. Another option would be for the government to pass legislation similar to that which was introduced by Sen. Tom Harkin (D-Iowa) – The Seasonal Influenza and Pandemic Preparation Act of 2009 – which would establish a nationwide, voluntary influenza vaccination program under which any individual may receive an annual influenza vaccine, free of charge.

State role

Even when the vaccine is distributed free of charge (as in the case of the H1N1 influenza vaccine) the vaccine administration fee could represent a major financial barrier for families who cannot gain access to free or reduced priced vaccination sites such as public health agencies, community health centers, and volunteer locations. In fact, the Institute of Medicine (IOM) has identified vaccine administration as a potential financial barrier to care.[123]

However, a review of state health insurance statutes and regulations focusing on those mandating coverage of immunization administration during a declared public health emergency, found that no state addresses coverage of vaccines or administration during periods of public health emergencies. An analysis of state laws by legal researchers at the George Washington University School of Public Health and Health Services, found that 32 states and D.C. maintain some level of pediatric immunization mandate. However, the mandates are weak, effectively leaving all states without mandatory coverage of routine immunizations for children under 18. (See TFAH's online supplement *State Laws Mandating Insurance Coverage of Vaccines for Children and Adults* available at www.healthyamericans.org).

This raises questions of how accessible private sector immunization services would be, particularly for larger families.

States might pursue two avenues for assuring individuals and families help with the cost of vaccine administration. One approach might be enactment of an insurance coverage mandate that requires insurers operating in both the individual and group health insurance markets to cover and pay for vaccine administration fees during periods of declared public health emergencies, when the vaccines themselves have been distributed on a nationwide basis.

An alternative approach would be to assess a modest "public health safety" fee assessed against both employers and insurers selling products in the individual and group health markets, which in turn could be used to create a specific fund to underwrite vaccine administration costs whether furnished in public settings or by private health care providers.

Either approach would provide critical financing to help defray the cost of vaccine administration during public health emergencies. The benefit of an insurance mandate is that it would utilize standard insurance claims payment methods for assuring payment to participating providers. Insurers could trigger their claims payment system once a public health emergency is declared, allowing providers whether in- or out-of-network to submit vaccine administration claims on members' behalf, using specially designed claims forms.

The benefit of the latter approach is that it would eliminate insurance administration complexities while assuring that, because of its structure as a public health preparedness statute rather than as an insurance product mandate, the financing mechanism would reach not only insurance products sold to employers in the group market but also employers who self insure and purchase only administered products, thereby exempting their plans from the reach of state insurance laws.[124] Such a fee could be paid directly to a state public health agency, which in turn could allot funds back to physicians, health care professionals, mass immunization entities and private health care providers who agree to payment conditions such as the elimination of point-of-service charges and acceptance of payment under such a program as payment in full.

INDIANA -- MOBILIZING COMMUNITY PARTNERSHIPS TO FIGHT H1N1

As the first wave of the H1N1 pandemic spread across the United States last spring, officials with the Indiana State Department of Health (ISDH) quickly realized that an effective response to the pandemic would require the entire community to be engaged and take appropriate action. To effectively handle the H1N1 flu state health officials would rely on the four critical pillars of a mitigation effort: nonmedical interventions that limit the spread of the virus; antiviral drugs; medical care; and vaccines.

Over the past several years, ISDH staff has used federal PHEP dollars and supplemental pandemic preparedness funding to develop relationships with various community partners, such as healthcare providers, emergency management, hospitals, primary and secondary schools, the media, and faith-based organizations. These essential relationships were developed using a systems-based approach as a foundation of ISDH's preparedness planning and response. Community partnerships were forged at the local level using pandemic influenza preparedness funding

Having developed these essential relationships, state health officials have been able to communicate to the general public and at-risk groups the importance of nonmedical interventions such as hand washing, covering coughs, and staying home when ill. In 2006, Indiana public health officials conducted a comprehensive state-wide gap analysis of pandemic influenza planning in all 92 counties, as an evidence-based approach to creating a stronger preparedness infrastructure across the state. Technical assistance has also been provided to rural Indiana hospitals to develop strategic plans for sustaining essential healthcare services, while meeting the demands placed on them by large numbers of patients with influenza.

Indiana public health officials have also worked with the private sector to ensure that businesses operating in Indiana have appropriate policies in place to ensure that employees who are sick are not pressured to come into work or penalized for staying home when they are ill. For example, both Purdue University and Indiana University changed graduation handshaking policies directly related to our communications, while Purdue and other universities changed policies for class attendance. In addition, Community Hospital changed their policy regarding illness. Originally, they were instructed to stay home for at least seven days if they developed the flu and were also told they must use vacation days. That policy changed -- staff no longer have to take vacation or paid-time-off if they are home sick -- because hospital administration officials decided that they did not want clinicians coming to work sick in order to save their vacation.

To ensure that residents infected with H1N1 or any other pandemic influenza have access to antivirals, the state stockpiled more than 650,000 treatment courses to be used in the event that private supplies were depleted. During the spring outbreak, the federal government released 25 percent of the SNS antiviral cache to states. Although there have been no reports of shortages at local pharmacies, ISDH decided to allow local health officers to use antivirals from the SNS to treat low-income patients who couldn't afford the cost of their antiviral prescriptions.

The ISDH also drew upon lessons learned from PHEP exercises and drills to develop a mass vaccination plan. The state actively engaged local health departments to ensure that community partnerships were mobilized to successfully achieve an efficient and equitable mass vaccination campaign. For many local health departments, Indiana's decision to allow them to hire a Preparedness Coordinator using federal PHEP dollars to develop preparedness plans and operations really paid off. The Tippecanoe County Health Department (TCHD) is a good example of return on investment. Through emergency preparedness dollars, the TCHD was able to hire a full-time person to work on planning, including planning for a pandemic. Even after federal funds were cut which supported this position, Tippecanoe County decided that this position was valuable and continued to fund it with county funds.

To assist those counties in Indiana without the resources to operate a mass vaccination clinic, ISDH has used the supplemental H1N1 funding to put together Immunization Strike Teams. The Strike Teams were developed for the small rural counties with limited assets to operate a mass vaccination clinic by themselves. The teams are composed of both personnel and supplies. The personnel package includes 31 personnel, including 22 Vaccinators; three RNs, one Clinical Nurse Supervisor and five Administrative Assistants/Runners. The local health department will also receive an Immunization Strike Team Supply kit that will provide them with items which may be needed during the Mass Vaccination Clinic. These teams are requested by the local health department and can be tailored to meet their needs.

Source: Indiana State Department of Health

Surge capacity, including offsite diagnosis

CDC estimates that about 22 million people were infected with 2009 H1N1 between April and October 17, 2009, and while not everyone sought treatment, the agency estimates there were about 98,000 H1N1-related hospitalizations, and nearly 4,000 deaths.[125] Hospitals, ambulatory care centers, and doctors' offices all have seen an increase in the number of patients seeking treatment for influenza. If the H1N1 virus were to mutate and become more severe, our health care system could easily be overwhelmed by an influx of severely ill patients, those with mild illness, and by people anxious to determine if they have the flu. One of the short-term solutions the U.S. government and health care sector have put forth is the use of telephone or Internet screening tools. In theory, these tools can ease the burden on health care facilities by encouraging patients with mild cases of flu to stay home and enabling more people to make a self-determination as to whether they should seek professional care

In early September, the IOM held a meeting on "Assessing the Severity of Influenza-Like Illness: Clinical Algorithms to Inform and Empower Health Care Professionals and the Public." At the meeting, the creators of Emory University's "Strategy for Off-Site Rapid Triage" (SORT) presented their tool, an online application that provides users with guidance on how to handle their influenza-like illness (ILI). The SORT application factors in the severity of the patient's condition and potential risk factors in determining whether to recommend the patient seek medical care. Emory University designed the tool so that it is easily understood by individuals with limited health literacy. To date, the Department of Veterans Affairs has announced that it will develop its own website based on the Emory model.

Hospitals are also experimenting with alternate care sites – in some cases tents set up in parking lots – where patients coming to the emergency department can be screened. Moving the screening out of the emergency departments (EDs) this also frees up scarce space and staff that is needed to treat the seriously ill.

A major concern for hospitals and health care providers is how to deal with a possible public health emergency and the resulting crush of patients while complying with the Emergency Medical Treatment and Labor Act (EMTALA). EMTALA is a federal law that requires all Medicare-participating hospitals with EDs to provide an appropriate medical screening exam to all individuals who come to the department, regardless of their ability to pay. If it is determined the patient presents an emergency medical condition, the hospital must treat and stabilize the patient within its capability or transfer the patient to a hospital that has capacity to do so.

State and local health departments and hospitals have expressed concerns about EMTALA compliance during a public health emergency, such as a pandemic flu outbreak. Will hospitals be able to provide adequate care when EDs are overwhelmed by the influx in surge of the sick and worried-well? In light of these concerns, President Obama declared a national emergency on October 23, 2009, paving the way for the health care system to offer a more streamlined response to the crisis.

This declaration set up the necessary conditions for Secretary of Health and Human Services Kathleen Sebelius to issue a Section 1135 waiver on October 27, 2009, which allows hospitals to direct patients seeking treatment at the ED to an alternative off-campus site.[126] In order for this type of EMTALA waiver to be granted, the following requirements must be met:

- The president has declared an emergency or disaster under the Stafford Act or the National Emergencies Act;
- The Secretary of HHS has declared a Public Health Emergency;
- The Secretary invokes her waiver authority (which may be retroactive), including notifying Congress at least 48 hours in advance; and
- The waiver includes waiver of EMTALA requirements and the hospital is covered by the waiver.

Prior to the President's declaration and the Secretary's Section 1135 waiver, in August 2009 the Centers for Medicare and Medicaid Services (CMS) issued guidance clarifying that there is flexibility in the EMTALA law.

Among the options for managing surge without a Section 1135 waiver, hospitals may:

- Set up alternative screening sites on campus outside of the ED;
- Establish a screening at off-campus, hospital-controlled sites; or
- Communities may set up screening clinics at sites not under the control of a hospital.

(For a more detailed discussion on surge capacity, please see *Section 3: Hospital Preparedness.*)

B. FUNDING FOR PANDEMIC AND ALL-HAZARDS PREPAREDNESS AND FUNDING FOR CORE PUBLIC HEALTH INFRASTRUCTURE

Public health infrastructure has been underfunded for decades, as documented in repeated assessments by CDC, IOM, and other experts. The gaps in infrastructure have hampered the nation's ability to respond to the H1N1 outbreak as effectively and quickly as possible. A key lesson learned from the outbreak is that until the infrastructure is strengthened, shortcomings in the core public health system will always leave the country unnecessarily vulnerable to emerging threats.

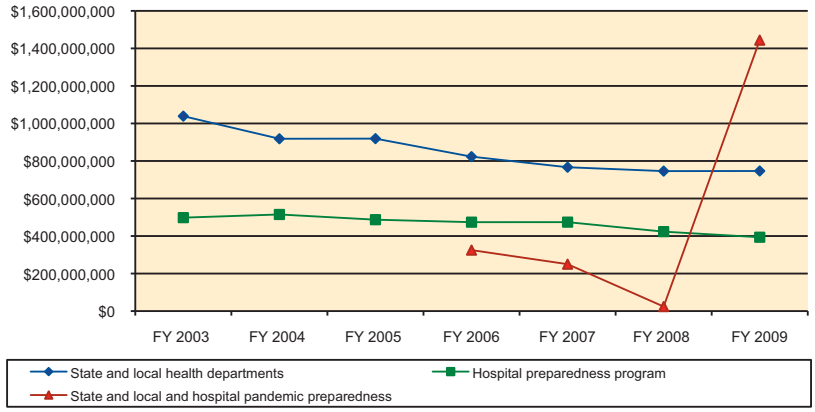
Current federal, state, and local public health spending is approximately $35 billion per year -- or $120 per person.[127] The federal government provides nearly 60 percent of these funds; state and local governments provide the remaining 40 percent. This spending represents less than two percent of the total National Health Expenditure Accounts. In 2008, TFAH, together with the New York Academy of Medicine (NYAM) estimated the current shortfall in spending on public health to be $20 billion per year.[128] This shortfall means that federal, state, tribal, and local public health departments are unable to adequately carry out core functions.

Federal public health funding has not even kept pace with inflation. To simply restore public health agencies to funding levels in 2005, the government would need to add $2.58 billion.

Congress has attempted to address the chronic underfunding of public health by including provisions in the House and Senate health reform bills that would dedicate a funding stream to core public health functions and prevention. For instance, the House bill contains a provision that would progressively increase up to $1.3 billion a year on state, local, and tribal public health infrastructure – to improve capacity for such basic things as laboratories, disease surveillance and vaccine delivery – as well as public health responsibilities not related to preparedness. It remains unclear if these provisions will become law.

To attempt to compensate for the chronic underfunding of public health, over the past seven years, the federal government has made a substantial investment in all hazards public health and pandemic preparedness appropriating more than $11 billion to state and local health departments and hospitals, including $2.043 billion for pandemic preparedness and response.[129] The funding, however, has not been sufficient enough to address the existing gaps, nor has it been sustained over time.

CDC's Upgrading State and Local Capacity*, ASPR's Hospital Preparedness Program (HPP), and HHS Supplemental Pandemic Preparedness Funding FY 2003 -- FY 2009



**Note: Upgrading State and Local Capacity includes funds for: PHEP Cooperative Agreements, Centers for Public Health Preparedness, Advanced Practice Centers, and all other state and local capacity. HPP line includes actual grant awards to states, ESAR-VHP funds, and funds used to support HPP evaluation activities and federal administration costs.*

Source: 1) Upgrading State and Local Capacity from CDC's FY 2010 Budget Justification document.[130] 2) Hospital Preparedness Program (HPP) funding from HHS's Public Health and Social Services Emergency Fund Budget Justification document.[131] 3) Pandemic Preparedness funding CDC Cooperative Agreement planning guidance documents and HHS news releases.[132]

Federal funding for public health preparedness is fragmented. Several different agencies and departments are responsible for various grant programs, including CDC, ASPR, and DHS. Each agency has its own funding requirements and objectives, presenting challenges for state and local health departments to develop comprehensive preparedness plans.

Instead of providing funding for preparedness in a sustained and stable manner, the federal government has cut core funding for public health preparedness since FY 2005 by 27 percent (adjusted for inflation), thus choosing to fund the crisis of the day by throwing large amounts of money at state and local health departments. This approach is extremely shortsighted and destined to fall short. As one state health official remarked, "I'd rather have received an additional $2 million per year over the past 10 years than $20 million this year. Our state would have been better prepared for H1N1 with longer-term, sustained funding."[133]

The cuts in core funding for public health preparedness have left states vulnerable at a time when the economic recession means they have fewer resources of their own to draw upon. With the sudden influx of supplemental pandemic preparedness funding this fall, many state health departments had trouble ramping up to spend this money after laying off thousands of public health workers. We don't fund fire departments at the moment a fire breaks out and we must move away from funding mechanisms that respond to public health emergencies.

1. Upgrading State and Local Capacity

The federal dollars that CDC uses to fund the state and local Public Health Emergency Preparedness (PHEP) cooperative agreements, the Centers for Public Health Preparedness, the Advanced Practice Centers, and all other state and local capacity have declined nearly 28 percent since FY 2005 when adjusted for inflation. The President's FY 2010 budget proposal included $761.1 million for upgrading state and local capacity, a modest increase of two percent from FY 2009's $746.6 million.[134]

2. Hospital Preparedness

In FY 2009, ASPR's Hospital Preparedness Program received $387.6 million, down seven percent from FY 2008. The slight decline in funding is part of ASPR's decision to align the HPP cooperative agreement budget with the states' budget year (July/June). As such, the FY 2009 funding period is 11 months. According to the President's budget request, in FY 2010, when the two budget years are aligned, funding will be restored to $426 million, which represents a one percent increase from the previous 12-month funding cycle in FY 2008.

By aligning the cooperative agreement budget year with the states' budget year and moving from a one-year planning cycle to a three-year planning cycle, ASPR hopes to address some of the concerns raised by HPP grantees in the program's five-year evaluation and allow for state health departments and hospitals to develop more realistic work plans.

3. Biomedical Advanced Research And Development Authority (BARDA)

The Pandemic and All-Hazards Preparedness Act of 2006 (PAHPA) directed HHS to establish the Biomedical Advanced Research and Development Authority (BARDA) to advance the development of medical countermeasures, such as vaccines, drugs, and diagnostic tools for public health emergencies. Established in 2007, BARDA is part of the Office of the Assistant Secretary for Preparedness and Response (ASPR).

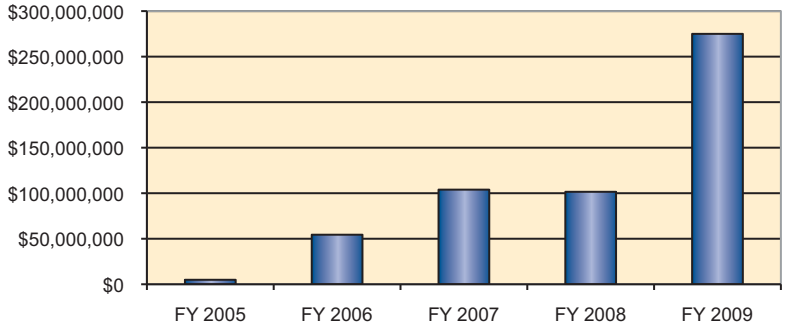
Among BARDA's responsibilities is the development and acquisition of medical countermeasures, including those for pandemic influenza, emerging infectious diseases, and chemical, biological, radiological, and nuclear (CBRN) threats. BARDA collaborates with other government agencies, such as CDC, FDA, and NIH, as well as research institutions, academics, private sector pharmaceutical companies and manufacturers and helps to foster research and development while balancing the inherent risks involved with developing new medical countermeasures and treatments.

Although the PAHPA legislation included authorization for approximately $1 billion for BARDA for FY 2007 through FY 2008, the U.S. Congress has failed to appropriate the full amount.

FY 2009 saw a significant increase in funding for BARDA with $275 million devoted for the advanced research and development, including $25 million for the development of next generation ventilators for pandemic preparedness.

The president's FY 2010 budget proposal includes $305 million for BARDA, an increase of $30 million over FY 2009. While these increases are encouraging, the basic budget for BARDA falls far short of what is needed for the agency to meet its own mission and goals. According to an analysis by the Center for Biosecurity, while

BARDA Funding History, FY 2005-FY 2009



Source: HHS's Public Health and Social Services Emergency Fund Budget Justification document.[135]

BARDA's current level of funding has allowed ASPR to set up the infrastructure necessary to support advanced research and development of medical countermeasures, it has been insufficient to support the successful development of a whole range of medical countermeasures. The Center for Biosecurity estimates that BARDA needs $1.7 billion to fully fund its research mission.[136] Funding would have to be sustained at this high level for many years, given the risks and costs associated with medical countermeasure development.

4. Pandemic Influenza Preparedness -- H1N1 Supplemental

Since the emergence of H1N1 this spring, officials have been racing against the clock to address many of the remaining issues. Congress appropriated $1.9 billion in emergency supplemental funding and an additional $5.8 billion in contingency funding, some of which has already been tapped by the Obama administration to enhance vaccine production, help bolster state and local health department capacity, upgrade surveillance capabilities, and meet other needs. In the last few months, $1.4 billion has been drawn from the available funds to assist states in their pandemic response and vaccination implementation programs.

Pandemic Influenza Preparedness and Response: FY 2009 Supplemental HHS Funds for H1N1
(dollars in millions)

	Direct Appropriation	Contingent Emergency Approp. Updated 8/31/091	Contingent Emergency Approp. 9/2/092	Total
Vaccine Production includes bulk vaccine antigen manufacturing, bulk adjuvant manufacturing, syringes/needles/fill finish, and vaccine production	1,117	1,426	1,006	3,548
Vaccination Campaign includes planning, state and local vaccine implementation/administration, vaccine distribution, and CDC vaccination campaign activities	30	335	1,084	1,449
Medical Surge Reserve Fund	0	53	0	53
Antivirals	0	0	232	232
Ongoing Pan Flu Activities with H1N1 Impacts	179	0	0	179
Deployment/Operations Support – ASPR	3	0	0	3
Upgrading State and Local Capacity including vaccination campaign planning, cooperative agreements for state and local through CDC, and cooperative agreements for hospitals through ASPR	350	0	0	350
Centers for Disease Control and Prevention including international response, domestic response, operations, community mitigation and port preparedness, communications, and virus detection	170	0	154	324
Food and Drug Administration	0	10	0	10
Compensation	1	1	0	2
HHS TOTAL	**1,850**	**1,825**	**2,475**	**6,097**
Department of Defense	0	0	140	140
Department of Veterans Affairs	0	0	68	68
US Department of Agriculture	0	0	28	28
State Department	0	0	5	5
Subtotal, Other Government Agencies	0	0	241	241
Federal Government TOTAL	**1,850**	**1,825**	**2,716**	**6,338**

**Note: This table details HHS's share of the $7.7 billion Congress appropriated for H1N1 response. A total of $5.8 billion in contingency funds are available at the Administration's discretion. These numbers represent the latest release of funds as of press time.*

1 $3.975 billion of the total Contingent Emergency Appropriation remains available as of 8/31/09

2 $1.259 billion of the total Contingent Emergency Appropriation remains available as of 9/2/09

Source: Office of Management and Budget

C. REAL-TIME DISEASE SURVEILLANCE SYSTEMS AND HEALTH INFORMATION TECHNOLOGY

> "TODAY, THE U.S. DOES NOT HAVE AN INTEGRATED, NATIONAL APPROACH TO BIOSURVEILLANCE THAT IS CAPABLE OF RESPONDING TO CATASTROPHIC HEALTH THREATS OR TO MORE FAMILIAR PROBLEMS SUCH AS THE CONTAMINATION OF FOOD SUPPLIES."
>
> -- NATIONAL BIOSURVEILLANCE ADVISORY SUBCOMMITTEE, APRIL 2009[137]

After the anthrax attacks in October 2001, the federal government began to focus on the need for a real-time biosurveillance system that would both help detect bioterrorism events and naturally occurring health threats such as a pandemic influenza or emerging infectious disease. Over the years legislation (PAHPA) and presidential directives (HSPD 21) have highlighted the importance of developing real-time disease detection capability. While there has been clear progress in evaluating existing biosurveillance systems and mapping out existing capacities, we are still far away from achieving real-time disease detection and surveillance.

According to a high-level government review of U.S. biosurveillance activities, "There is no overarching strategy that establishes the objectives of a National Biosurveillance Enterprise or that lays out the implementation plan for such a system."[138]

A major barrier is the very nature of biosurveillance. While the federal government, namely HHS and DHS, has taken the lead in developing a national biosurveillance system, multiple other federal agencies have their own surveillance systems, not to mention the 50 states. By one estimate, there are more than 300 separate biosurveillance efforts underway across all levels of government. For the most part these efforts are neither integrated nor interoperable, and their effectiveness is unclear in some cases.

Funding is also an issue. While state and local health departments and hospitals have been able to tap into preparedness funding to build and strengthen biosurveillance systems, the level of funding for biosurveillance is well below what is needed to establish a 21st century real-time biosurveillance system. Cuts in federal preparedness dollars in recent years, coupled with state budget cuts due to the economic recession, threaten to erode the gains we have made in enhancing our nation's biosurveillance capacity. As the National Biosurveillance Advisory Subcommittee notes, "In effect, we are asking states to fund systems that are essential to U.S. national security, without establishing a coherent planning or funding strategy to sustain the keystones of the National Biosurveillance Enterprise."[139]

And while the federal government provides funding for numerous surveillance programs, formal legal authority for collecting public health and clinical surveillance data lies with the state and local health departments. Therefore, the federal government cannot mandate that state health departments report data through a national system. Since there is no federal mandate, reporting varies greatly among state health departments, and even among programs in the same state health department.

One way for the federal government to eliminate such discrepancies in reporting would be to make reporting in a standardized format a condition of federal grant dollars. While this may work to solve some of the variability in reporting, in those instances where the government doesn't fund surveillance activity it will not be an option.

For those instances, federal, state, and local public health officials could work to develop systems where information is shared both ways. Too often state and local health departments and health care providers complain that for all the data they send to the system they get little to nothing in return.

The $20 billion the federal government is directing towards the development of new health information technology (HIT) as part of the 2009 American Recovery and Reinvestment Act (ARRA) offers a prime example of where new technology can be developed taking state and local public health officials' considerations and needs into account. The Office of the National Coordinator for Health Information Technology (ONC), part of HHS, is leading the Administration's HIT efforts, including the promotion of nationwide health information exchange to improve health care.

As part of the ARRA, Congress authorized the Centers for Medicare & Medicaid Services (CMS) to provide reimbursement incentives for

eligible professionals and hospitals who are successful in becoming "meaningful users" of certified electronic health record (EHR) technology. These incentive payments begin in 2011 and gradually decrease. Starting in 2015, providers are expected to have adopted and be actively utilizing a certified EHR in compliance with the "meaningful use" definition or they will be subject to financial penalties under Medicare.

The ONC is currently working on the "meaningful use" definition, which TFAH believes should incorporate public health surveillance considerations. ONC expects to release the "meaningful use" definition in late 2009.

TRACKING H1N1 -- EXISTING SYSTEMS RAMPED UP

In April 2009, initial reports from Mexico suggested a highly lethal novel influenza virus was circulating in the population. CDC's epidemiology and surveillance divisions called upon existing surveillance and disease detection systems to track the novel influenza virus. Over the course of the H1N1 pandemic, CDC has used these systems to analyze information about influenza disease activity in the United States and publishes findings of five "Key Flu Indicators" in a report called FluView (available online at http://www.cdc.gov/flu/weekly/).

The Key Flu Indicators include the following:

ILINet: Reports from 3,200 providers in the United States are compiled weekly on visits for influenza-like illness (ILI). There are participating providers in all 50 states, the District of Columbia and the U.S. Virgin Islands reporting over 25 million patient visits each year. Each week, approximately 1,400 outpatient care sites around the country report data to CDC on the total number of patients seen in doctors' offices and emergency departments and the number of those patients with influenza-like illness (ILI) by age group. For this system, ILI is defined as fever (temperature of 100°F [37.8°C] or greater) and a cough and/or a sore throat in the absence of a KNOWN cause other than influenza. Sites with electronic records use an equivalent definition as determined by the state public health authorities.

Emerging Infections Program: CDC has greatly increased the capacity to collect detailed information on patients hospitalized with influenza. Using the 198 hospitals in the Emerging Infections Program (EIP) network, and six additional sites with 76 hospitals, CDC monitors a population of 25.6 million to estimate hospitalization rates by age group and monitor the clinical course among persons with severe disease requiring hospitalization. The EIP sites also track vaccine effectiveness.

122 Cities Mortality Reporting System: Each week, the vital statistics offices of 122 cities report the total number of death certificates received and the number of those for which pneumonia or influenza was listed as the underlying or contributing cause of death by age group. The percentage of all deaths due to pneumonia and influenza (P&I) are compared with a seasonal baseline and epidemic threshold value calculated for each week.

Surveillance for Influenza-associated Pediatric Mortality: Influenza-associated deaths in children (0-17 years) was added as a nationally notifiable condition in 2004. Laboratory-confirmed influenza-associated deaths in children are reported through the Influenza-Associated Pediatric Mortality Surveillance System.

Geographic Spread: State health departments report the estimated level of spread of influenza activity in their states each week through the State and Territorial Epidemiologists Reports. States report influenza activity as no activity, sporadic, local, regional, or widespread.

Expanding Testing Capability: Within two-and-a-half weeks of first detecting the novel 2009 H1N1 virus, CDC had fully characterized the new virus, disseminated the information to researchers and public health officials, and developed and begun shipping to states a new test to detect cases of 2009 H1N1 infection. CDC continues to support all states and territories with test reagents, equipment, and funds to maintain laboratory staff and ship specimens for testing. In addition, CDC serves as the primary support for public health laboratories around the globe and has provided test reagents to 295 laboratories in 147 countries. It is vital that accurate testing continue in the United States and abroad to monitor any changes in the virus that may indicate increases in severe infection, resistance to antiviral drugs, or a decrease in the match to circulating vaccine strains.

Monitoring severe illness and mortality of women who are pregnant: Pregnant women are a group known to be at a higher risk for seasonal influenza. Similarly, data indicate that pregnant women also are at higher risk of severe disease and death from the 2009 H1N1 influenza virus. CDC is in the process of implementing a new system to collect data on severe illness (intensive care hospitalization) and mortality among pregnant women, which will improve its ability to monitor this group.

Aggregate Hospitalizations and Deaths Reporting Activity (AHDRA): To supplement several well-established influenza surveillance systems, CDC introduced an interim data collection activity to augment information on hospitalizations and deaths in 2009. This supplemental activity collects information from all 50 states to identify hospitalizations and deaths due to influenza or influenza-like-illness (ILI) nationally and within each state. Jurisdictions now can report to CDC either laboratory-confirmed or clinical pneumonia counts of hospitalizations and deaths. Initiated on September 1, 2009, this new collection activity will contribute to a more complete picture of the burden of serious influenza and pneumonia illness and deaths during the pandemic and let each state examine trends in the course of the pandemic in their areas.

Health Care System Readiness: HHS is also using multiple systems to track the impact of the H1N1 outbreak on our healthcare system. HHS and CDC are in constant communication with state health officers and hospital administrators to monitor stress on the healthcare system and to be prepared in case federal medical assets will be necessary to augment state and local surge capabilities. To date, state and local officials have been able to accommodate the increased patient loads, but this is something health officials need to monitor very closely, and need to be prepared to respond quickly if the situation warrants.

THE DISTRIBUTE PROJECT: A NOVEL APPROACH TO DISEASE SURVEILLANCE

The Distribute Project, or the Distributed Surveillance Taskforce for Real-time Influenza Burden Tracking and Evaluation Project, is a real-time display of summarized daily data for influenza surveillance.[140] Distribute is an influenza surveillance project that CDC is supporting to complement its existing mix of influenza surveillance approaches and to enhance national and regional influenza situational awareness. The project collects data from state or local health departments that conduct emergency department (ED)-based syndromic surveillance and involves collection of data on ED visits for influenza-like illness. The project represents an extension of a pilot project that was conducted by the International Society for Disease Surveillance (ISDS) and was initiated with CDC funding.

The Distribute project represents a novel approach to developing a national surveillance system, as responsibility for implementing this system is more "distributed" than traditional CDC approaches. Together, CDC and ISDS have conducted outreach to all states, territories, and selected localities that independently conduct syndromic surveillance. To date, 43 state or local jurisdictions have agreed to participate, although the number that are fully engaged and have data represented on the Distribute website is smaller. As of October 6, 2009, 19 states and five local health departments were reporting data to Distribute via ISDS or CDC. State health departments reporting data included those from: Alabama, Arizona, Connecticut, Georgia, Indiana, Michigan, Minnesota, Missouri, Nebraska, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Rhode Island, Utah, Virginia, Washington, and Wisconsin. The local health departments from Boston, MA, Denver, CO, New York City, NY, Seattle, WA, and Tarrant County, TX were also reporting data.[141]

CDC is focusing on closing this gap and bringing more state and local health departments into the program. While the process of connecting to the Distribute system is relatively simple, health departments that are already extraordinarily busy may need additional resources to participate in Distribute. CDC allowed state and local health departments to use some of their H1N1 supplemental funding to support participation in Distribute.

BIOSENSE

CDC developed BioSense in 2002 to serve as an early-event detection system that collects clinical information from hospitals, such as patients' symptoms, quantities and types of drug prescriptions, and the number of emergency room visits, among other data. This type of surveillance, known as syndromic surveillance, relies on information available well before an official diagnosis or confirmed lab result. Some public health officials believe this type of surveillance can be crucial to alerting them to possible disease outbreaks or bioterrorism, while others are skeptical about the merits of syndromic surveillance in providing outbreak recognition.

Most experts agree, however, that syndromic surveillance can provide information that can be used to help the progress of an outbreak as has been seen during the 2009 influenza pandemic with CDC's ILInet. Nevertheless, even the most developed syndromic surveillance systems do not provide adequate situational awareness. For example, although ILI-based surveillance systems represent some of the most highly-developed syndromic surveillance systems that are in existence at national and state levels, public health response to the 2009 H1N1 pandemic was still limited by critical data gaps. Answers to key response questions, such as how many people are infected and how severe are the illnesses will require more robust data linkages between public health and the healthcare sector than currently exist.

Numerous government reports have faulted the program for its failure to deliver on its promises of real-time syndromic surveillance. According to a November 2008 report from the U.S. Government Accountability Office (GAO), "Federal, state, and local public health officials expressed mixed views on the usefulness of BioSense data as compared with the usefulness of data from similar systems."[142] In fact, about half of the officials surveyed said that they rely on other systems as their primary tool for syndromic surveillance. For example, public health officials with the Department of Defense (DOD) prefer DOD's Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE). Meanwhile, Department of Veterans Affairs (VA) public health personnel use the civilian version of ESSENCE more often than BioSense. Both DOD and VA officials stated that ESSENCE allows more flexibility in evaluating and viewing data than BioSense.

In response to the critiques, CDC launched a redesign of the program in late 2007 hoping to improve collaboration with state and local public health departments and health care facilities. However, GAO has faulted this redesign for lacking "reliable cost and timeline estimates and outcome-based performance measures," without which there's an increased risk "that the agency will perpetuate weaknesses identified in its initial implementation of the program and related system."[143]

The President's FY 2010 budget proposal seeks $34.4 million for BioSense, which is essentially unchanged from FY 2009 levels.

BIOWATCH

BioWatch is DHS's environmental monitoring system, which is designed to serve as an early warning system in the event of the release of biological agents by monitoring and testing air samples. BioWatch sensors were first deployed in 2003 and there are currently some 500 sensors located in some 30 major U.S. metropolitan areas.[144]

The goals of BioWatch are to:

- Deliver early warning of a biological attack by identifying the presence of a biological agent to minimize casualties;
- Assist in providing evidence on the source, nature, and extent of an attack to aid law enforcement and public health officials; and
- Determine where the biological attack occurred and what populations were exposed.

The president's FY 2010 budget request includes $94.5 million for BioWatch, which is $17 million lower than the FY 2009 budget.[145] No explanation was given for the 15 percent decrease in funding between fiscal years.

Critics of BioWatch point to its high cost and have suggested that the money would be better spent on enhancing hospital-based rapid diagnostic capabilities. BioWatch has also suffered from sensors picking up bioagents occurring naturally in the environment that were not related to any sort of terrorist attack. In fact, most of BioWatch detections have been environmental detection events of indigenous organisms, while a few were related to lab cross-contamination.

There have also been some problems with state public health laboratories, 29 of which host the BioWatch program and provide dedicated office and lab space for the BioWatch program free of charge.[146] APHL and DHS continue to work together to address some of state public health lab's lingering concerns.

ROLE FOR HEALTH INFORMATION TECHNOLOGY (HIT) IN PUBLIC HEALTH EMERGENCIES

Under U.S. law, state public health departments are responsible for disease surveillance. Therefore, any transmission of nationally notifiable disease data from state and local health departments to CDC is strictly voluntary. Limited resources at the state and local level inhibit a further expansion of disease surveillance in some jurisdictions.

Several states and jurisdictions have used federal preparedness dollars to purchase innovative health information technology that supports public health emergency preparedness while also improving medical care at state hospitals and health clinics.

Some state and local public health departments have contracted with Logical Images, manufacturer of the software, Visual Dx, which is an integrated information system that provides users with a comprehensive collection of some 17,000 digital medical images and illustrations of over 900 visually identifiable diseases. The information in Visual Dx is regularly updated and reviewed by physicians. Clinicians who are presented with an unfamiliar visually diagnosable condition can access the system and are able to view multiple images, including images of diseases in patients with darker skin tones, which can improve diagnoses in minority patients.

While the software can have an immediate impact on patient care, it also enhances public health preparedness. The software can help clinicians quickly identify potential bioterrorism attacks, outbreaks, and emerging infectious diseases. The user is able to customize the software to receive 24/7 relevant online alerts and, in the case a suspected notifiable disease, the software system directly links users to public health departments, which enhances public health surveillance and disease reporting.

As of October 2009, eight state health departments had launched Visual Dx using federal preparedness dollars, including: Delaware, D.C., Georgia, Indiana, South Carolina, South Dakota, Virginia, and Wyoming. Another eight local health departments and/or regional consortia also had launched Visual Dx, including: Texas DSHS Region 8/San Antonio Metro Health District, Los Angeles County Department of Health, Oregon Healthcare Preparedness Region 9, Polk County, Iowa, Bradford County, Florida, Union County, Florida, Madison County, Florida, and the New York Regional Resource Centers.

GE Healthcare is another company that is working to integrate point of care information into electronic medical records (EMR). In April 2009, GE Healthcare announced a collaboration with CDC's National Center for Public Health Informatics. The project will demonstrate the capability of a public health agency to utilize EMR systems to provide clinicians with timely, patient-specific information at the point of care.

CDC routinely disseminates important health alerts, advisories and notifications-via email and on the agency's website-to public health practitioners and clinicians. The pilot program will explore the feasibility of creating and integrating actionable alerts with GE's Centricity® EMR system based on patient record content, using a standard messaging format. The project will determine the EMR's ability to identify specific patients with risk factors related to the health condition identified in the alert, enabling clinicians to immediately act on the alerts by addressing the impacted patients. Additionally, the development of a feedback mechanism to capture the provider's response will be explored.

Studies have shown that EMR systems with decision support can improve clinician compliance by, among other ways, presenting vaccine reminders to clinicians for immunizing high-risk persons for influenza, identifying high-risk persons for tuberculosis screening and alerting physicians of potential prescribing errors.

D. THE IMPLEMENTATION OF THE 2006 PANDEMIC AND ALL-HAZARDS PREPAREDNESS ACT (PAHPA)

In 2006, Congress reauthorized the public health emergency preparedness legislation passed in the wake of September 11, 2001 and the anthrax attacks. The 2006 PAHPA legislation has helped to strengthen the nation's preparedness and response planning, including acknowledging the threat of pandemic flu and the need for increased transparency and accountability for preparedness activities. The legislation included a series of benchmarks for federal agencies to meet over the five-year span of the Act. Seven of these deliverables were due no later than 180 days after the enactment of PAHPA, or by the end of June 2007. Another set of four deliverables were due no later than December 2007, or 12 months after enactment. Three more deliverables were due between October 1, 2008 and January 2009. Funding, however, was not provided for the implementation of the PAHPA benchmarks. In spite of this, as of November 2009, 12 of the 14 benchmarks have been met, which is commendable, given staffing and funding constraints at the federal level.

However, some of the unmet or partially completed deliverables are crucial to the nation's preparedness, including:

- Development of new, outcome-oriented performance measures;
- Enhanced real-time disease detection and surveillance; and
- Advanced research and development of countermeasures.

Congress should hold regular oversight hearings to monitor the progress and implementation of PAHPA.

E. EMERGENCY CARE ISSUES

Federal policies for sick leave do not support the recommendations for the best ways to provide care and reduce the spread of disease during a public health emergency.

1. Sick Leave

One proven non-pharmaceutical intervention to slow or curb the spread of a pandemic is to stay home if you are sick, or keep your child home if they are sick. At a news conference in late April President Obama emphasized this: "If you are sick, stay home. If your child is sick, keep them out of school."[147]

This advice presents special challenges for the nearly half of American workers in the private sector who do not have any paid sick leave available. This amounts to more than 59 million people.[148] This statistic also disproportionately includes women, low-wage, and part-time workers.

In an already unstable economic situation, individuals who are sick and should stay home may still go to work for fear of lost wages or losing their job. According to Debra L. Ness, the president of the National Partnership for Women and Families, "This could be the beginning of a spiral into economic disaster. People can't just cavalierly put their jobs or paychecks at risk."[149]

This could mean that restaurants, child care centers, nursing homes, hotels, public transit systems, schools, and offices across the country could be operated and run by individuals infected with the flu who should be at home, not at work.[150] In addition to lacking personal sick leave, another 94 million workers do not have sick leave that enables them to take time off to care for an ill child, spouse, or parent.

In new guidance issued on August 19, 2009, CDC recommends actions businesses should take to decrease the spread of influenza in the workplace during the 2009 flu season.[151] One recommendation is to keep sick workers home and not let them return to work until 24 hours after their fever is gone. The guidance stresses the importance of allowing sick workers to stay home without fear of losing their job.

Although existing law, the Family and Medical Leave Act, allows employees to take unpaid sick time due to a serious illness, the law exempts 40 percent of the workforce who work at small and mid-size businesses, does not cover less severe communicable diseases, and does not mitigate the fear of lost income or lost employment among many workers.

These deficiencies in the law indicate that a federal paid sick days law is necessary. Proposed legislation that seeks to address this need includes the Healthy Families Act, sponsored by Rep. Rosa DeLauro (D-CT) and Sen. Christopher Dodd (D-CT). This legislation would require employers with 15 or more employees to offer up to seven days of job-guaranteed paid sick leave each year, to be used to deal with individual medical needs or to care for sick family members. Although the bill has garnered over

100 House cosponsors and over 20 Senate cosponsors in the 111th Congress, the Healthy Families Act has not been taken up in either Chamber. While some argue that this legislation is good for public health in general, because sick individuals should not attend work and risk infecting coworkers and the public, others point out that seven days of paid sick leave may not be enough to minimize the spread of disease during a public health emergency such as a pandemic flu outbreak. However, given the political realities surrounding the legislation, such as opposition to any paid sick day requirements by some employer groups, the existing language is a positive step toward addressing shortcomings in existing law.

In the absence of a federal paid sick days law, the U.S. Office of Personnel Management (OPM) issued draft guidance asserting that the government may extend new leave policies to federal employees providing care to family members with the H1N1 flu.[152] Federal employees would be able to use accrued or accumulated sick leave to stay home to care for a family member if a doctor or other health official determines that their presence in the workplace might jeopardize the health of co-workers and to use advanced sick leave if they have exhausted their annual allotment. The proposal is not likely to go into effect until well into the H1N1 outbreak, however, and the proposed rules would not affect government contractors, who often do not have any sick leave available.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SECTION 3

Health Care System Preparedness

In public health emergencies, such as the ongoing novel influenza A/H1N1 outbreak, a bioterror attack, or catastrophic natural disaster, U.S. hospitals and health care facilities will be on the front lines providing triage and medical treatment to individuals. In the best of times, however, most emergency rooms and intensive care units (ICUs) must confront bed shortages and staffing issues; in a mass casualty event – particularly a pandemic influenza or mass bioterror attack – the situation could quickly spiral out of control.

The importance of surge capacity, or the ability of a health care system to expand quickly beyond normal services to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies, cannot be understated.[153] The challenge of how to equip hospitals and train health care staff to handle the large influx of critically injured or ill patients who show up for treatment after or during a public health emergency remains the single, most challenging issue for public health and medical preparedness.

Over the past decade, the U.S. Department of Health and Human Services (HHS) has led national efforts to develop surge capacity for catastrophic events. The Office of the Assistant Secretary for Preparedness and Response (ASPR) manages the Healthcare Preparedness Program (HPP), which awards one-year grants to hospitals to improve surge capacity and enhance community and health care system preparedness for all-hazards, including bioterrorism and pandemic influenza. Meanwhile, the Agency for Healthcare Research and Quality (AHRQ) funds research on medical and public health preparedness and has developed guidance and tools for hospitals and health care facilities. The U.S. Centers for Disease Control and Prevention (CDC) oversees the public health preparedness initiatives, including the Public Health Emergency Preparedness (PHEP) grants to state and local health departments.

Although much progress has been made since the terrorist attacks of September 11, 2001 and the devastation wrought by Hurricanes Katrina and Rita in 2005, there are still three crucial areas that need to be addressed.

- First, there is the issue of how to pay for health care system preparedness and the development and maintenance of surge capacity;
- Second, there is the problem of helping the health care sector weather and recover from the economic fallout of a mass casualty event; and
- Finally, mass casualty care presents a serious challenge to the nation. There are personnel and logistics issues related to mass casualty care that must be addressed, as well as a much needed national dialogue and consensus as to what constitutes a disaster standard of care, which includes both the rationing of scarce resources, legal liability issues, compliance with health care laws and regulations, and reimbursement.[154]

As the nation considered health reform, one important issue that was largely overlooked was emergency care in mass emergency situations, particularly for those who are uninsured or underinsured. The health reform legislation does include provisions to increase our nation's investment in prevention and wellness, including a dramatic increase in core public health infrastructure and workforce and a focus on community prevention, which could improve the health of some of our most vulnerable populations. As the Assistant Secretary of Preparedness and Response Dr. Nicole Lurie outlined in an op-ed in the *New England Journal of Medicine* (written before her appointment to this office), these investments could in turn boost community resiliency and thus help increase public health emergency readiness.[155] However, a reformed U.S. health system should not only have the necessary policies in place, for example, setting national standards for surge medical response capability, but also must tackle the central issue of financing emergency preparedness.

This section provides an overview of the current challenges facing U.S. hospitals and health care providers. Strengthening our nation's safety net will require a collaborative effort by health care providers, hospital administrators, public health officials, private payers, and citizens, combined with strong leadership from federal, state, and local government.

A. MASS CASUALTY CARE

> "THE NATION'S TRACK RECORD IN PLANNING FOR, FUNDING AND ACHIEVING EVEN MINIMALLY ADEQUATE DISASTER SURGE RESPONSE CAPABILITIES WITHIN THE MEDICAL COMMUNITY IS WOEFULLY DEFICIENT."
>
> -- DR. JEFFREY W. RUNGE, FORMER CHIEF MEDICAL OFFICER, OFFICE OF HEALTH AFFAIRS, DHS[156]

According to the U.S. Government Accountability Office (GAO), as of 2005 there were approximately 950,000 staffed hospital beds in the United States, meaning that health care staff was available to attend to the patient occupying the bed. However, in a mass casualty event, such as a severe pandemic influenza, HHS expects that demand would far exceed capacity.[157]

The question for hospitals, health care facilities, clinicians, and hospital administrators is how to handle the surge of patients.

Do they have the necessary space to treat to the critically injured and sick?

How will they allocate scarce resources such as ventilators and pharmaceuticals?

Will they have enough trained, licensed health care workers to care for the patients?

What impact will legal issues have on the care of patients during a public health emergency?

1. Crisis Standards of Care

There is growing recognition in the United States that a mass casualty event, particularly a pandemic influenza, will result in the need to alter and adapt the traditional standards of care appropriate to the situation. Unfortunately, as an article in the *New England Journal of Medicine* notes, under current federal and state law, governors can declare a state of emergency during disasters, "suspending some of the normal standards without giving any idea of what the alternative standards ought to be."[158]

According to HHS, "states in conjunction with professional societies will determine the appropriate standards of care for the situation – not HHS or the federal government."[159] Although AHRQ has published two documents on mass casualty care – *Altered Standards of Care in Mass Casualty Events* (2005) and *Mass Medical Care with Scarce Resources* (2007) – these are intended merely to serve as planning guidance for states and professional associations as they develop "definitive guidance."[160]

Although these guidance documents have been helpful and have spurred further discussion at the state and local level, a 2008 U.S. Government Accountability Office (GAO) report on states' planning for medical surge, found that fewer than half of states surveyed were planning for crisis standards of care to be used in a mass casualty event.[161] In order to further the planning for crisis standards of care, GAO recommended that the Secretary of HHS establish a clearinghouse for sharing crisis standards of care guidelines developed by individual states or medical experts. The Center for Biosecurity echoed that recommendation in their evaluation of the first five-years of the Hospital Preparedness Program.[162] (See Section A for information on the Planning and Development of Altered Standards of Care.)

2. Health Facility Planning Considerations

During a mass casualty event, emergency departments, critical care units, rehabilitation beds, and ambulatory care centers can become overwhelmed. The H1N1 pandemic has shown how quickly regular health care capacity can be stretched to the limits.

Any sort of mass casualty event with increased hospitalizations and heavy emergency department and intensive care unit utilization will put a strain on health care facilities and health care workers. To help hospitals prepare for such an event, much of the current guidance focuses on the three S's – supplies, staff, and space.

- **Supplies:** Today's hospitals and health care facilities function with a "just-in-time supply chain," meaning very limited supplies, including pharmaceuticals, are stored on-site and instead are replenished on an as-needed basis. While the use of a just-in-time supply chain keeps hospital storage costs down, it also "creates a significant threat to successful disaster response."[163] Hospital administrators argue that it is not feasible for hospitals to stockpile large quantities of supplies as they lack both the space to do so and the resources to pay for these extra supplies. In addition to the supplies, hospitals are likely to run short of needed technologies, such as ventilators and decontamination units.
- **Staff:** Workforce shortages plague hospitals and health care facilities even in the best of times. It is no wonder then that workforce shortages are a serious concern for mass casualty event planning. According to a June 2008 report from the Center for Studying Health System Change, "the day-to-day shortages of key health personnel – such as nurses, physicians, pharmacists, laboratory technicians, and respiratory therapists – exacerbate the challenge of having sufficient numbers of health workers in an emergency."[164] The report goes on to note that until elected officials and policy makers address these challenges, "the ability to have adequate personnel for an emergency will be limited."[165]
- **Space:** During a mass casualty event, hospitals will be pressed to treat a sudden influx of injured and sick patients. Hospitals will have to take action to maximize the efficient delivery of patient care. This may include discharging patients early if they can safely continue their care at home, or canceling elective surgeries and procedures. In the H1N1 pandemic, some hospitals were forced to set up alternate care sites, such as large tents in parking lots, where patients could be screened before entering the hospital to reduce patient loads in emergency departments. An analysis of patients hospitalized with H1N1 during the first wave (April - June 2009), found that among those hospitalized 25 percent were admitted to the intensive care unit (ICU).[166]

B. FINANCING HEALTH CARE SYSTEM PREPAREDNESS AND CATASTROPHIC EMERGENCY CARE

1. Health Care System Preparedness

> "SOME EXISTING MECHANISM FOR ONGOING INVESTMENT MUST BE FOUND TO ACCOMPLISH [SURGE MEDICAL RESPONSE]. IT CAN'T BE COST-SHIFTED ONTO THE CUSTOMERS OF THE SYSTEM, GRANTS WILL NOT BE ADEQUATE UNLESS BILLIONS MORE ARE APPROPRIATED, AND LOCAL GOVERNMENTS MAY NOT BE ABLE TO AFFORD TO SUPPLEMENT THEIR HEALTH CARE INSTITUTIONS TO THAT DEGREE TO COUNTER WHAT, IN THE CASE OF TERRORISM, IS AN ATTACK ON OUR NATION."
>
> -- DR. JEFFREY W. RUNGE, FORMER CHIEF MEDICAL OFFICER, OFFICE OF HEALTH AFFAIRS, DEPARTMENT OF HOMELAND SECURITY.[167]

Currently, health care system preparedness is financed through the Hospital Preparedness Program (HPP), which focuses on improving the clinical response to a large-scale health emergency. Initially run by the Health Resources and Services Administration (HRSA), HPP is now run by the Office of the Assistant Secretary for Preparedness and Response (ASPR) as mandated by the 2006 Pandemic and All-Hazards Preparedness Act. ASPR awards one-year funding grants to hospitals and other health care facilities to improve surge capacity and enhance community and health care system preparedness for all-hazards, including bioterrorism and pandemic influenza. These grants average around $80,000 a year per hospital. An article in the Journal of Law, Medicine and Ethics notes that "this barely permits the hiring of a preparedness coordinator, leaving nothing for the infrastructure development and maintenance that would be required."[168]

The current approach to funding health care system preparedness has frustrated many hospital administrators and clinicians. Hospitals and health care associations have argued that the easiest way to address this problem is to boost health care system preparedness program grants from general revenue taxes.

However, a 2006 study by the Center for Biosecurity estimated that hospital preparedness for a severe (1918-like) pandemic would require a one-time investment of an average of $1 million per hospital, for a total of $5 billion for the 5,000 general hospitals in the United States, plus an additional $200,000 per hospital per year in maintenance costs.[169] Dr. Jeffrey Runge, the former Chief Medical Officer in the Office of Health Affairs at DHS, notes that this amount exceeds the entire homeland security grant funding. "Clearly," he says, "the Federal government cannot grant its way to success."[170]

Expanding preparedness into the ambulatory care setting

A key lesson from the current H1N1 pandemic is that the ambulatory care system needs more help in preparing for emergencies. Both this spring and fall, doctors' offices have been overrun by patients who have H1N1 or were concerned that they or their children did. During a public health emergency, like a pandemic, health providers at all levels have to adapt their regular practices to treat a large number of patients very quickly. Currently, however, there are no federal, state, local programs to help clinics or private practices to train or adapt to an emergency.

2. Catastrophic Emergency Care

As TFAH has noted in the 2007 and 2008 reports, even if comprehensive health reform is passed, it will take some years before the new system is in place and all Americans have health insurance. In the meantime, the federal government should act now to create a framework for emergency health coverage and reimbursement.

A public health emergency benefit would have to address two separate concerns for providers and patients. It would have to guarantee providers some level of compensation for the services they provide during a pandemic, while encouraging individuals to come forward for diagnosis or treatment.

In fact, such legislation was introduced in the 111th Congress by Senator Richard Durbin (D-IL) and Representative Lois Capps (D-CA). The bill, the Public Health Emergency Response Act (PHERA), would establish a temporary emergency health benefit for uninsured individuals and individuals whose health insurance coverage is not actuarially equivalent to benchmark coverage. The benefit could only be triggered if the Secretary of Health and Human Services (HHS) declared that a public health emergency existed under section 319 of the Public Health Service Act and chose to activate the benefit. The benefit would last for up to 90 days; the Secretary could extend it once for another 90 days. The funding mechanism in the legislation is the Public Health Emergency Fund; the bill would clarify that using the Fund for uncompensated care is permissible. The legislation authorizes $7 million each year for the administration of this fund and for a public education campaign about the program, and Congress would need to appropriate money to the Fund only after the Secretary activated the benefit. It would also ensure that coverage would be provided for individuals displaced by a public health emergency and would clarify the scope of coverage.

It is best to create these mechanisms prior to an emergency, rather than in the heat of the moment when any delay would be counted in lives lost. In addition, prior planning may enable the government to be more cost-effective in using scarce resources. Planning ahead for a catastrophic public health emergency is the best way to avoid needless loss of life or wasted resources.

Recommendations

SECTION 4

Overall, this report finds that significant progress has been made in the nation's preparedness to respond to public health emergencies based on state-by-state measures and available data. All states have developed plans to receive and distribute medical countermeasures from the federal stockpile. Lab capacity has grown exponentially in the seven years that TFAH has tracked state preparedness, while electronic disease reporting and real-time syndromic surveillance are in use in the majority of states. State legislatures have enacted liability protection for health care volunteers who serve in public health emergencies, and in some cases, extended that protection to non-profit entities who donate goods and services. Americans are seeing a return on the investments made over the past decade.

Gaps remain, however, in some critical areas, including: health care system preparedness, collaboration between public health and private providers, national real-time disease surveillance, and the development of medical countermeasures and domestic production capacity. And the progress that has been made is threatened by cuts in the federal and state budgets. The ongoing H1N1 pandemic, which has sickened more than one million by U.S. government estimates, is further stressing a system that has been chronically underfunded. Our country is only as secure as the least prepared state; there is a federal interest and responsibility to assure a minimum level of preparedness throughout the country.

To further strengthen emergency preparedness, TFAH recommends action across the following key areas:

A. Public health preparedness funding;
B. Health care system preparedness funding;
C. Financing catastrophic emergency care
D. Transparency, accountability, and oversight;
E. Health care preparedness;
F. Public health workforce;
G. Research and development;
H. Legal preparedness;
I. Health and sick leave benefits; and
J. Community resiliency.

A. PUBLIC HEALTH PREPAREDNESS FUNDING

Public health preparedness requires a well-trained public health workforce, a sustained effort at research and development, the building and maintenance of stockpiles of countermeasures, and hospital surge capacity. Yet federal funding for public health emergency preparedness declined by 27 percent between FY 2005 and FY 2009. It's not surprising then, that federal, state, and local public health agencies were forced to scramble in the spring of 2009 when the H1N1 flu virus first emerged in the United States. Funding cuts frequently result in workforce reductions or hiring freezes. Without a trained public health workforce, preparedness suffers. Preparedness requires that we have enough qualified laboratory scientists who analyze lab specimens and transmit those results to federal, state, and local health officials; epidemiologists and health information specialists who develop and run biosurveillance systems to monitor disease rates and warn of bioterror or foodborne disease outbreaks; stockpile managers who receive, store, and dispense medical countermeasures; and public health nurses and doctors who vaccinate populations against infectious diseases such as H1N1. The federal government should provide increased and stable funding for preparedness activities to state and local health departments. It is a shared responsibility between the federal government and the states. State-generated revenues invested in public health should, therefore, increase as well. As demonstrated in this report, federal funding has fluctuated – limiting the ability of states to build the kind of response capacity that is needed to prepare for everything from a pandemic to a natural disaster to a terrorist attack. The variation in critical state investment in public health also reflects a significant variation in geographic capacity.

Recommendations for Funding	
Fully fund and stabilize funding for state public health emergency preparedness activities.	FY 2009 funding for programs dedicated to bioterrorism and public health emergency preparedness capabilities, specifically programs intended to support upgrading state and local capabilities, was $746 million. **The PHEP Cooperative Agreement should be funded at $1.02 billion, which is the FY 2005 level adjusted for inflation.** These funds are used to develop core boots-on-the-ground support for disaster response and any reduction in funding leaves the country at unnecessary levels of risk. Inconsistencies in funding from year to year means that states cannot predict how much money they will receive and this affects their ability to hire and train staff, expand capacity, and implement new programs. A stable funding stream for public health preparedness could also reduce the need for emergency supplemental dollars.
Pandemic influenza funding	Any after-action reports completed by federal, state, and local public health authorities on their response to the H1N1 pandemic, should include an assessment of how the emergency supplemental funding was used. This should be the basis to determine how much funding is needed to maintain pandemic preparedness.
Increase funding for BARDA	In FY 2009, BARDA received $275 million, which is nowhere near the amount needed for advanced research and development of medical countermeasures. Congress should appropriate **$1.7 billion for biological countermeasures and diagnostics, and make the funds available over multiple years in the Public Health and Social Services Emergency Fund (PHSSEF) for BARDA's Advanced Research and Development Fund.**
Funding should be appropriated for the replenishment and maintenance of federal and state stockpiles, as many parts of the stockpiles are set to expire in the coming years. Funding should also be provided to restore those supplies deployed in response to the H1N1 pandemic.	HHS Secretary Kathleen Sebelius should give the president and Congress, a professional judgment budget that includes the cost of replenishing and maintaining stockpiles. Funding to buy new medical countermeasures may require a new Act of Congress as the 2004 Project BioShield does not allow for replenishment and maintenance costs.
Funding should be appropriated for public health systems research, which is needed to develop evidence-based performance standards.	PAHPA required HHS to work in coordination with the research community and evaluation specialists and develop new objectives to measure how well states respond to major public health emergencies. PAHPA specifically required CDC's Centers for Public Health Preparedness (CPHP) to focus on systems research, **but overall CPHP funding was not increased to account for the program.** CDC should provide Congress with a professional judgment budget that includes the cost of fully funding the CPHPs and the Preparedness and Emergency Response Research Centers (PERRCs) to carry out their important work on public health workforce preparedness and public health emergency preparedness research and evaluation.
A fully-funded and reliable funding stream is needed to support public health.	Public health infrastructure has been underfunded for decades, according to assessments from CDC, IOM, and other experts. It is important that states have a reliable, dedicated, and sustained level of funding that is adequate to meet core capacities and to continue to keep pace with new technologies that can help the states better meet their needs of their communities. Congress should assure a robust, reliable funding stream through health reform legislation for all core public health activities.
Core public health infrastructure capabilities must be modernized.	There is no system in place to ensure that basic public health systems and equipment keep pace with advances in science and technology. There needs to be a systematic way to ensure that the technology and equipment that support core functions, like laboratory testing and communications, are routinely updated.

B. FINANCING HEALTH CARE SYSTEM PREPAREDNESS

Health care system preparedness requires significant investments in infrastructure, staff, and supplies. When funding declines – whether at the federal, state, or local level – the immediate impact on health care system preparedness may not be evident. After all, in the United States we are fortunate that catastrophic health emergencies are rare events. However, funding cuts in the Hospital Preparedness Program (HPP) have severely curtailed preparedness activities across the nation. In a public health emergency, health care systems and workers will be on the front lines, but as a nation we have not equipped them with the resources and training they need. The federal government should provide increased and sustained funding for health care system preparedness activities – whether through the existing HPP or through a new funding mechanism.

Recommendations for Financing Health System Preparedness	
Fully fund the Hospital Preparedness Program.	The HPP focuses on improving the clinical response to a large-scale health emergency, which includes both developing surge capacity and continuity of operations planning. On average, hospitals receive about $80,000 per year, but some receive as little as $10,000 per year. In FY 2009, the HPP was funded at $393 million. **In the short-term, this crucial program should be funded at $588 million, which is the FY 2004 level adjusted for inflation.** ASPR is in the process of realigning the HPP funding with the states' fiscal year (July/June). ASPR also should consider transitioning the HPP one-year grant to a multi-year grant which would enable states, health care coalitions, and hospitals more time to implement their activities and to monitor and evaluate their effectiveness.
Expand the hospital preparedness program to include the ambulatory care system.	As we have seen over the course of the H1N1 pandemic, ambulatory care centers and doctors' offices have been overwhelmed by the surge in patients seeking care. Presently, there is no system in place to help build capacity among these providers. Congress should reexamine the PAHPA legislation and consider directing ASPR to expand the existing HPP grants beyond hospitals to include both ambulatory care clinics and private practitioners.
Develop a long-term solution to funding hospital preparedness.	In the long-term, the administration and Congress should examine ways to build hospital preparedness into the federal health care financing system, by providing, for example, enhanced reimbursement rates under Medicare to those facilities that are willing to expand and maintain their emergency response capacity. This would remove the funding of hospital preparedness from the unpredictability of the annual appropriations cycle.

C. FINANCING CATASTROPHIC EMERGENCY CARE

Even if health reform succeeds, it will be several years before near-universal coverage is achieved. In the meantime, a public health emergency will create financial hardships for individuals and the health care system. Because compliance with recommendations to seek immediate care and/or self-isolate or quarantine may be critical to containing the spread of influenza or a terrorist-introduced organism, TFAH believes the federal government should take steps to assure that lack of health insurance does not prevent compliance with public health recommendations.

Recommendations for Financing Catastrophic Emergency Care	
Establish an emergency health benefit.	Congress should establish a short-term emergency health benefit, which would allow hospitals and health care centers to keep functioning during a prolonged public health emergency, while ensuring care to uninsured and underinsured individuals affected by the crisis. Legislation currently under consideration in Congress, the Public Health Emergency Response Act (PHERA), would help ensure that victims of catastrophic public health emergencies have meaningful and immediate access to medically necessary health care services.

D. TRANSPARENCY, ACCOUNTABILITY, AND OVERSIGHT

The Pandemic and All-Hazards Preparedness Act (PAHPA) gave the federal agencies, namely HHS, a series of deliverables and deadlines to produce and meet. While much progress has been made on the implementation of PAHPA, which is notable in light of personnel and funding constraints, much remains to be done. To ensure HHS fully complies with PAHPA and does so in an open and transparent manner, pursuant to the provisions of the statute, Congress should use its oversight powers to ensure full implementation and execution of PAHPA.

Recommendations for Strengthening Transparency, Accountability and Oversight	
Publish regular progress reports on the implementation of PAHPA.	HHS should regularly provide publicly available updates on the progress made on benchmarks and deliverables under the PAHPA statute. The first and only progress report was released in November 2007.
Continue to develop new evidence-based benchmarks and objective standards.	CDC's Division of State and Local Readiness' Outcome Monitoring and Evaluation Branch is working closely with PHEP program and evaluation specialists to develop a new set of performance based metrics to measure organizational readiness and response to public health emergencies. As of November 2009, CDC had introduced new, evidence-based benchmarks for two of the five areas identified for initial performance measure development: Incident Management and Crisis & Emergency Risk Communications (CERC). Work continues on outcome oriented objectives for the remaining three priority areas: Biosurveillance, Countermeasure Distribution, and Community Containment strategies. TFAH applauds this work and encourages CDC and its federal, state, and academic partners to continue to work on developing metrics that focus on outcome results from real-life drills and exercises.
Develop and implement the use of standardized preparedness exercises.	CDC, in coordination with other government agencies, state and local health departments, research organizations, and universities, should develop and implement the use of standardized public health preparedness exercises. The exercises should include a thorough evaluation and after-action report that is made publicly available. Any weaknesses or gaps identified in the evaluation should be addressed within a specific amount of time.
Incorporate lessons learned into future planning, in particular through assessment of this year's response to the H1N1 pandemic.	The federal government, working with state and local officials, should ensure that all public health authorities conduct a systematic evaluation of the response to H1N1. Lessons learned from these after-action assessments should be incorporated into pandemic and all-hazards preparedness planning.
Collect performance data; assess the results; and, annually release the findings publicly on a state-by-state basis.	As required by PAHPA, HHS is in the process of developing a standardized reporting form for all states and hospital grantees. The use of this form will allow HHS to rate the performance of the grantees and to assure the proper expenditure of funds. Data from this form and other evaluations of states' emergency preparedness should be reported yearly on a state-by-state basis. This allows Americans to appropriately assess their states' progress and document how states have used taxpayer-supported preparedness funds.
Continuous revision and strengthening of preparedness plans	Federal and state agencies need to keep preparedness plans updated to account for changes in the environment and advancements in scientific knowledge. This includes updating the National Strategy on Pandemic Influenza and all state pandemic plans to reflect the lessons learned in H1N1.

E. HEALTH CARE SYSTEM PREPAREDNESS

The ability of the U.S. health care system to handle a large influx of patients – surge capacity – remains the largest threat to the nation's ability to respond to a major catastrophe such as a pandemic influenza. Much remains to be done to ensure that the U.S. health care system is able to function in a mass-casualty event. In addition to the funding recommendations discussed above, TFAH suggests the following:

Recommendations for Surge Capacity	
Crisis standards of care planning and development	States currently are responsible for planning and developing crisis standards of care, but progress on this front is quite varied, with some states much further along than others. Inconsistencies in standards of care among states could undermine the public's trust and make it harder for them to accept crisis standards of care. To eliminate this potential barrier, the federal government should play a much more active role in the planning and development of crisis standards of care, considering it has experience making prioritization decisions in a public health emergency. For example, federal agencies issued the H1N1 flu vaccine prioritization, so they should be able to offer more specifics for crisis standards of crisis standards of care planning and development. The federal government should take steps to address the legal issues associated with shifting to a different paradigm of providing health care when the need for care overwhelms available resources (i.e., staff, supplies, space) during catastrophic public health emergencies.
Regional coordination of health care facilities, including alternative care sites, with public health and emergency management	Hospitals, state and local health departments, and emergency management agencies should continue to build and strengthen regional consortiums to organize and plan for public health emergencies. Such regional collaboration can lead to more efficient use of resources among hospitals and health departments, including personnel, and facilitate the sharing of promising practices. This coordination should include all federal resources active in the region, including VA and DOD facilities. (Regional efforts could be within a locality or across county and/or state lines depending on the size of the communities involved.)
Alternate care sites	Despite the clear need for alternate care sites following a mass casualty event, there are several barriers to their successful roll-outs. To address these barriers, TFAH recommends the following measures: 1) Increase local, state, and regional planning with clear delineation of responsibilities and authority; 2) Foster public-private partnerships among health care practitioners; 3) Employ operational drills to test the deployment of mobile units and the creation of alternative care sites; and, 4) Address licensing and liability concerns for health care workers, behavioral health professionals, and volunteers and liability concerns for non-health care volunteers; and third-party entities that play host to alternative care sites. In addition, emergency planners will need to obtain, stockpile, and store supplies, equipment and medicines for use in the alternative care sites.
Surge workforce	Public and private health care organizations should develop means to boost staff during a public health emergency, through the use of incentives for current staff, the development of crisis standards of care to allow for changes in staffing ratios and administrative work requirements for staff, and the use of volunteers or non-traditional staff, such as emergency medical technicians and medical and nursing students. The surge workforce should be recruited in advance in order to ensure licensing and accreditation issues are resolved before an emergency strikes.

F. PUBLIC HEALTH WORKFORCE

The growing workforce shortage in the health care and public health fields threatens U.S. emergency preparedness. America's response will be severely limited, unless the workforce challenges the public health system faces are addressed. PAPHA contained two key provisions related to workforce development, whose implementation TFAH supports. But much more remains to be done to address the public health workforce crisis. Current health reform legislation before Congress includes a variety of provisions to strengthen and support the U.S. public workforce.

Recommendations for Public Health Workforce	
Fund and implement PAHPA workforce provisions.	Congress should appropriate and allocate the necessary funds to implement the HHS workforce demonstration project. This student loan repayment project is intended for individuals who: 1) are eligible for the National Health Service Corps loan repayment program and 2) also agree to serve in a state health department that provides service to a significant number of health professional shortage areas or has areas that are at risk of a public health emergency. Congress should also appropriate and allocate monies necessary to execute the second PAHPA workforce provision, which allocates grants to states to assist in operating state loan repayment programs.
Establish a public health workforce loan repayment program.	To attract the next generation of public health workers, the federal government should establish a public health workforce loan repayment program. Health reform legislation currently under consideration in Congress includes a provision to establish a public health workforce loan repayment program to eliminate critical public health workforce shortages in federal, state, local and tribal public health agencies. In FY 2010, $195 million is authorized to be appropriated for this program, and such sums are necessary for FY 2011-2015.
Enact and fund comprehensive public health workforce scholarship initiatives.	More needs to be done to recruit, train, and retain a qualified public health workforce. The current health reform bills under consideration in Congress include provisions that would establish a public health workforce training and enhancement program consisting of awarding grants and contracts for public health training programs and fellowships and traineeships for students who participate in these programs and who plan to specialize or work in the field of public health.
Bolster the state and local public health workforce.	The federal government should provide federal matching funds to state and local governments to invest in recruitment, retention, training, and retraining for public health workers. Legislation currently before Congress would establish a competitive health workforce development grant program to enable state partnerships to complete comprehensive planning and to carry out activities leading to coherent and comprehensive health care workforce development strategies at the State and local levels. The proposed legislation authorizes $8 million for planning grants and $150 million for implementation grants for FY 2010 and such sums for each subsequent year.
Strengthen the U.S. Public Health Service Commissioned Corps.	Congress should strengthen the U.S. Public Health Service Commissioned Corps by increasing the number of active duty personnel, creating a "Ready Reserve Corps" to train and respond to public health emergencies, and establishing a dedicated funding stream for all Corps activities under the management and fiscal control of the Surgeon General. The health reform legislation under consideration in Congress includes provisions that would both 1) eliminate the cap on Commissioned Corps, which is currently set at 2,800, and 2) establish a Ready Reserve Corps to participate in training exercises, be available and ready for involuntary calls to active duty during national emergencies and public health crises, be available for deployment and for backfilling positions left vacant during deployment of active duty Corps members, and be available for service in isolated, vulnerable and medically underserved communities.
Recruit the next generation of public health workers.	Congress and the Administration should develop programs to expose and recruit high school students into health careers, with a focus on careers in public health. The health reform bill before Congress includes such language for the creation of a Youth Public Health Program.
Support public health systems research on workforce needs and capacity.	The U.S. government should support the establishment of a high-level commission or advisory body to study the workforce needs of the 21st century public health system. Health reform legislation before Congress would establish a commission to disseminate information on: current and projected health care workforce supply and demand, healthcare workforce education and training capacity, retention practices for health care professionals, and recommendations on the development of a fiscally sustainable integrated workforce.

G. RESEARCH AND DEVELOPMENT

The basic technology and tools of public health need to be modernized. Too often, front-line health care professionals are relying on outdated diagnostic tests and medications. As new tests and therapies are developed and as older ones become obsolete, the SNS should be replenished.

Recommendations for Research and Development	
Enhance research and development of vaccines and public health technologies.	Basic technology and tools of public health must be modernized to adequately protect the American people. This includes research and development of vaccines and improved chemical laboratory testing capabilities. Collaboration with the private sector as envisioned under BARDA and Project BioShield will be essential.
Continue to assess new influenza vaccine technologies.	The U.S. Food and Drug Administration (FDA) should move forward in assessing new technologies that are already in use in influenza vaccines in other countries -- including use of adjuvants and cell-based vaccines. If data from other countries do not meet FDA's standards, FDA should work closely with industry and the National Institutes of Health (NIH) to collect the data needed for decision making.
Clarify requirements and deliverables under Project BioShield contracts.	ASPR should coordinate with NIH, FDA and CDC to ensure future BioShield requests for proposals and procurement contracts for new countermeasures have clearly articulated requirements, expectations, and deliverables.
Bolster domestic production capacity for countermeasures, including vaccines, and personal protective equipment (PPEs).	As we have seen during the course of the H1N1 flu pandemic, the United States has limited production capacity for manufacturing flu vaccines and personal protective equipment, such as N95 respirator masks. These shortages have led to confusion, and in some cases fear and panic among the U.S. population. The U.S. government, working through BARDA or other federal agencies, should direct more money to growing domestic production capacity for pandemic countermeasures.
Expand the Shelf Life Extension Program.	Congress should extend the Shelf Life Extension Program (or establish a new, parallel, SLEP-like program within FDA) to include states' and locals' antiviral and antibiotic medications. Currently, state and local stockpiles could have shorter shelf lives even though the nation is depending on state and local stockpiles to meet national goals.
Modernize disease surveillance systems.	Every health department and health agency should be part of a 21st century surveillance system that meets national standards and is interoperable between jurisdictions and agencies to ensure rapid information sharing. Surveillance systems should be able to detect and help manage response to infectious disease outbreaks or a bioterrorist attack. Plans should ensure adequate laboratory surveillance of influenza and other infectious diseases, as well as testing for pathogens such as E. Coli, Methicillin-resistant Staphylococcus aureus (MRSA), and extensively drug-resistant Tuberculosis (XDR-TB).
Modernize an obsolete food safety system.	Congress should enact strong food safety modernization legislation that would give FDA increased authority and tools to prevent foodborne illness. Bills currently before Congress include provisions that would allow FDA to require food plants to identify potential hazards and take steps to mitigate them, trace foodborne outbreaks, increase inspection of facilities, and recall tainted foods.
Public health should be a central part of the design and implementation of health information technology systems.	Current health information technology is concentrated on electronic health records (EHRs), which are used to improve patient care and efficiency. As the use of EHRs grows, public health officials' need for near real-time data on disease surveillance should be factored into their design and implementation. Public health officials can use data from EHRs to monitor the health of the population and the demand for care, making them invaluable tools to help detect and mitigate public health emergencies. In order to encourage the development of EHRs that also benefit public health, the Office of the National Coordinator for Health Information Technology (ONC) is releasing proposed meaningful use criteria that will define how new health IT systems developed with funds from the 2009 American Recovery and Reinvestment Act (ARRA) function.

H. LEGAL PREPAREDNESS

This report has underscored the critical need for states to develop full legal preparedness for all-hazards public health emergencies. All four core elements of public health legal preparedness should be addressed: laws and legal authorities; competency in using law; coordination across sectors and jurisdictions in implementing law-based interventions; and legal best practices.

Recommendations for Legal Preparedness	
State liability protections for volunteer health professionals	Liability concerns are a growing challenge to emergency preparedness officials. Volunteers and private entities have expressed reluctance to participate in response and recovery efforts for fear that their actions may make them liable. State legislatures should adopt the UEVHPA, which has been approved by both the National Conference of Commissioners on Uniform State Laws and the American Bar Association, or enact similar legislation that extends liability protection to volunteer health professionals in a public health emergency.
State liability protections for volunteer health professionals	Congress should amend the Public Health Service Act to provide Federal Tort Claims Act protection to qualified ESAR-VHP participants when they are activated by the federal government in response to a public health emergency. The federal Public Health Security and Bioterrorism Preparedness and Response Act of 2002 authorized the ESAR-VHP to help states develop registry systems for the timely identification, verification and use of volunteer health professionals during public health emergencies.[171] In 2006, PAHPA required the federal Secretary of Health and Human Services to link the state systems into a single national network of systems.[172] The state systems continue to be maintained by the individual states, with guidance from the federal government. Despite ongoing efforts to build this national network, the liability issues that can arise from activating the ESAR-VHP remain an area of concern.[173]
State entity emergency liability protection	State legislatures should consider extending Good Samaritan liability protections to those non-health care volunteers and business and non-profit entities that provide emergency assistance.
State insurance laws should mandate the coverage of vaccines during declared public health emergencies.	States should enact an insurance coverage mandate that requires insurers operating in both the individual and group health insurance markets to cover and pay for vaccine administration fees during periods of declared public health emergencies, when the vaccines themselves have been distributed on a nationwide basis. The benefit of an insurance mandate is that it would utilize standard insurance claims payment methods for assuring payment to participating providers. Insurers could trigger their claims payment system once a public health emergency is declared, allowing providers, whether in- or out-of-network, to submit vaccine administration claims on members' behalf, using specially designed claims forms.

I. HEALTH AND SICK LEAVE BENEFITS

A public health emergency will create financial hardships for individuals and the health care system. Because compliance with recommendations to seek immediate care and/or self-isolate or quarantine may be critical to containing the spread of influenza or a terrorist-introduced organism, TFAH believes the federal government should take steps to assure that lack of health insurance or sick leave do not prevent compliance with public health recommendations.

Recommendations for Health and Sick Leave Benefits	
Establish minimum paid sick leave standards.	The H1N1 flu pandemic has once again validated public health officials' concerns that employees who lack paid sick leave will show up for work when they are sick and infect coworkers and/or customers. Congress should enact legislation that would require employers to offer paid sick leave, which also could be used by employees to care for sick children or other family members. Proposed legislation that seeks to address this need includes the Healthy Families Act, sponsored by Rep. Rosa DeLauro (D-CT) and Sen. Christopher Dodd (D-CT). This legislation would require employers with 15 or more employees to offer up to seven days of job-guaranteed paid sick leave each year, to be used to deal with individual medical needs or to care for sick family members.
Set up emergency sick leave policies and procedures.	The federal government should clarify whether the Department of Labor's Disaster Unemployment Assistance Program as currently established would cover workers without sick leave who self-quarantine in the event of a pandemic flu.

J. COMMUNITY RESILIENCY

HSPD-21 identifies community resilience as one of "the four most critical components of public health and medical preparedness," along with mass casualty care, mass distribution, and biosurveillance. The U.S. government defines "community resiliency" as the ability of a community to cope and recover from a disaster or public health emergency. A CDC-funded study states that in order "for a community to be resilient, its members must put into practice early and effective actions, so that they can respond to adversity in a healthy manner."[174]

Taking this into account, preparedness plans need to consider the diverse needs of the U.S. population, in particular, "at-risk," "special needs," and "vulnerable" populations. Only by effectively reaching out to all segments of the U.S. population can the country appropriately be prepared to survive and overcome crises.

Recommendations for Strengthening Community Resiliency	
Guard against complacency.	One of the biggest challenges facing public health emergency preparedness is complacency. Federal, state, local, tribal, and territorial governments must maintain a sense of urgency regarding preparedness. Officials should communicate the importance of preparedness to the public while not resorting to scare tactics. Engagement with media is the key to building a heightened sense of awareness around the issues of emergency preparedness, especially at the community level.
Engage communities in planning.	Federal, state, local, tribal, and territorial governments must engage communities in local emergency and pandemic planning. Too often emergency planners just look to their grantees and ignore other key stakeholders, such as volunteer organizations, religious institutions, and schools and universities. Planners must proactively approach these diverse groups and bring them to the table.

Recommendations for Strengthening Community Resiliency	
Develop a community education campaign promoting vaccination for H1N1 and all other influenza vaccines, and all vaccines in general.	The U.S. Centers for Disease Control and Prevention (CDC), working with other federal, state, and local partners, should develop an education campaign to assure the American people about the safety and effectiveness of the H1N1 (and all other) influenza vaccines and all vaccines in general. It is important to remind Americans that even with the delays in vaccine availability, they should get vaccinated as soon as they can. It is not clear that the pandemic has peaked, and even if it has, many who might still get sick are still at risk and could be protected by a vaccine. Moreover, historically there is always the danger of a third pandemic wave, which may or may not be more severe than the previous two waves. So being vaccinated now will give critical protection for those who have not become ill during the initial waves. Vaccine hesitancy during the H1N1 vaccination campaign has highlighted the need for ongoing education and outreach to Americans, including underserved populations, about the importance and safety of regular inoculations.
Focus on disease prevention and health promotion.	Americans cannot be prepared if they are unhealthy, yet chronic disease rates are spiraling out of control in this nation. More than two-thirds of American adults are overweight or obese. One in four has heart disease; and one in three has high blood pressure. Twenty-four million Americans have type 2 diabetes and another 54 million are pre-diabetic. These underlying health conditions pose a challenge when residents are asked to evacuate due to a public health emergency. And we have seen during the H1N1 pandemic that those with chronic conditions are more at risk for complications. Persons dependent on prescription drugs also face challenges when asked to shelter-in-place as they may run out of their medicines. The 2009 American Recovery and Reinvestment Act (ARRA) included $650 million for community-based interventions, which can be used to bolster resiliency. In addition, the health reform legislation before Congress includes a dedicated funding stream for core public health functions, including prevention of chronic disease.
Communicating effectively with at-risk individuals	Federal, state, local, tribal, and territorial officials must design culturally competent risk communication campaigns that use respected, trusted, and culturally competent messengers. Current research and best-practices regarding emergency preparedness communication strategies for at-risk populations should direct the creation and dissemination of these messages.
Children are not small adults and pandemic and all-hazards preparedness plans must consider the unique needs of children.	Children are inherently vulnerable as they depend upon adults for food, shelter, supervision and guidance. As such, their needs should be taken into account in all public health emergency and pandemic preparedness efforts. Because disease susceptibility, outcome, and transmission will likely differ for children when compared to adults, recommendations for child social distancing during a pandemic will likely differ from social distancing recommendations for adults. Evacuation and reunification planning should reflect the fact that children are often separated from their parents for much of the day. These plans should also take into account children with special needs. Child advocates, such as teachers and pediatricians, should be consulted as plans are made. Preparedness plans should be clearly communicated to parents, schools, and daycare facilities.
The president and Congress should carefully consider the recommendations from the National Commission on Children and Disasters, which are due out in 2010.	The National Commission on Children and Disasters, a bi-partisan panel appointed by the president and Congressional leaders, is tasked with examining and assessing the needs of children independently, and in relation to the preparation, response and recovery from all emergencies, hazards and disasters. Following its two-year investigation, the Commission will issue a final report, complete with findings and recommendations, to the president and Congress. These recommendations should be acted upon with utmost urgency.

APPENDIX A: CDC AND ASPR PREPAREDNESS GRANTS BY STATE

BIOTERRORISM FUNDING BY SOURCE AND YEAR								
	FY 2008				FY 2009			% Change
State	CDC	ASPR	Total	State	CDC	ASPR	Total	FY 08-FY 09
Alabama	$10,241,093	$6,073,401	$16,314,494	Alabama	$9,984,931	$5,528,753	$15,513,684	-5.16%
Alaska	$5,015,000	$1,312,013	$6,327,013	Alaska	$5,015,000	$1,232,661	$6,247,661	-1.27%
Arizona	$14,227,671	$7,972,742	$22,200,413	Arizona	$13,658,394	$7,242,486	$20,900,880	-6.22%
Arkansas	$7,435,489	$3,906,396	$11,341,885	Arkansas	$7,279,503	$3,573,514	$10,853,017	-4.50%
California	$50,161,370	$32,625,884	$82,787,254	California	$49,341,755	$29,486,456	$78,828,211	-5.02%
Colorado	$11,141,885	$6,260,449	$17,402,334	Colorado	$10,637,403	$5,697,522	$16,334,925	-6.53%
Connecticut	$8,927,705	$4,747,354	$13,675,059	Connecticut	$8,704,406	$4,332,291	$13,036,697	-4.90%
Delaware	$5,000,000	$1,534,297	$6,534,297	Delaware	$5,000,000	$1,433,223	$6,433,223	-1.57%
D.C.	$6,698,743	$1,707,585	$8,406,328	D.C.	$6,461,359	$1,589,577	$8,050,936	-4.41%
Florida	$32,940,501	$22,422,494	$55,362,995	Florida	$32,906,612	$20,280,168	$53,186,780	-4.09%
Georgia	$18,689,009	$11,847,828	$30,536,837	Georgia	$18,146,190	$10,738,888	$28,885,078	-5.72%
Hawaii	$5,228,184	$2,057,849	$7,286,033	Hawaii	$5,144,507	$1,905,612	$7,050,119	-3.35%
Idaho	$5,405,739	$2,277,157	$7,682,896	Idaho	$5,330,380	$2,103,488	$7,433,868	-3.35%
Illinois	$19,912,211	$12,605,863	$32,518,074	Illinois	$19,985,919	$11,422,845	$31,408,764	-3.53%
Indiana	$13,335,867	$8,151,131	$21,486,998	Indiana	$12,979,201	$7,403,442	$20,382,643	-5.42%
Iowa	$7,702,063	$4,113,883	$11,815,946	Iowa	$7,540,433	$3,760,725	$11,301,158	-4.56%
Kansas	$7,598,339	$3,849,684	$11,448,023	Kansas	$7,446,545	$3,522,344	$10,968,889	-4.37%
Kentucky	$9,750,535	$5,597,192	$15,347,727	Kentucky	$9,510,505	$5,099,081	$14,609,586	-5.05%
Louisiana	$9,998,186	$5,696,194	$15,694,380	Louisiana	$9,756,363	$5,188,408	$14,944,771	-5.02%
Maine	$5,271,144	$2,102,569	$7,373,713	Maine	$5,183,337	$1,945,059	$7,128,396	-3.44%
Maryland	$13,038,391	$7,305,500	$20,343,891	Maryland	$12,690,042	$6,640,448	$19,330,490	-5.24%
Massachusetts	$14,805,770	$8,301,006	$23,106,776	Massachusetts	$14,323,704	$7,538,670	$21,862,374	-5.69%
Michigan	$20,453,241	$12,734,552	$33,187,793	Michigan	$20,123,542	$11,538,958	$31,662,500	-4.82%
Minnesota	$12,616,406	$6,761,826	$19,378,232	Minnesota	$12,055,280	$6,149,904	$18,205,184	-6.44%
Mississippi	$7,629,747	$4,027,180	$11,656,927	Mississippi	$7,467,891	$3,682,495	$11,150,386	-4.54%
Missouri	$13,029,088	$7,580,577	$20,609,665	Missouri	$12,475,814	$6,888,644	$19,364,458	-6.43%
Montana	$5,022,876	$1,644,766	$6,667,642	Montana	$5,019,036	$1,532,896	$6,551,932	-1.77%
Nebraska	$5,877,064	$2,642,978	$8,520,042	Nebraska	$5,774,382	$2,433,560	$8,207,942	-3.80%
Nevada	$7,652,253	$3,524,243	$11,176,496	Nevada	$7,292,961	$3,228,706	$10,521,667	-6.22%
New Hampshire	$5,317,054	$2,093,475	$7,410,529	New Hampshire	$5,244,492	$1,937,756	$7,182,248	-3.18%
New Jersey	$18,788,803	$11,072,985	$29,861,788	New Jersey	$18,247,856	$10,039,764	$28,287,620	-5.56%
New Mexico	$7,054,780	$2,868,709	$9,923,489	New Mexico	$6,853,141	$2,637,233	$9,490,374	-4.56%
New York	$22,518,790	$13,941,707	$36,460,497	New York	$22,171,004	$12,628,147	$34,799,151	-4.77%
North Carolina	$16,696,497	$11,232,884	$27,929,381	North Carolina	$16,224,492	$10,184,038	$26,408,530	-5.76%
North Dakota	$5,023,132	$1,270,585	$6,293,717	North Dakota	$5,023,393	$1,195,281	$6,218,674	-1.21%
Ohio	$21,838,104	$14,409,789	$36,247,893	Ohio	$21,312,180	$13,050,486	$34,362,666	-5.49%
Oklahoma	$8,740,269	$4,837,520	$13,577,789	Oklahoma	$8,536,905	$4,413,646	$12,950,551	-4.84%
Oregon	$9,100,217	$4,984,817	$14,085,034	Oregon	$8,884,916	$4,546,549	$13,431,465	-4.87%
Pennsylvania	$23,758,643	$15,576,347	$39,334,990	Pennsylvania	$22,975,362	$14,103,046	$37,078,408	-6.09%
Rhode Island	$5,012,619	$1,793,799	$6,806,418	Rhode Island	$5,000,000	$1,667,365	$6,667,365	-2.09%
South Carolina	$9,968,869	$5,736,768	$15,705,637	South Carolina	$10,097,336	$5,225,017	$15,322,353	-2.50%
South Dakota	$5,000,000	$1,447,580	$6,447,580	South Dakota	$5,000,000	$1,354,980	$6,354,980	-1.46%
Tennessee	$12,844,807	$7,818,211	$20,663,018	Tennessee	$12,495,537	$7,103,056	$19,598,593	-5.43%
Texas	$43,355,376	$28,988,249	$72,343,625	Texas	$42,816,952	$26,204,300	$69,021,252	-4.81%
Utah	$7,162,839	$3,590,331	$10,753,170	Utah	$7,018,990	$3,288,335	$10,307,325	-4.33%
Vermont	$5,041,316	$1,256,092	$6,297,408	Vermont	$5,042,969	$1,182,205	$6,225,174	-1.16%
Virginia	$17,222,047	$9,762,140	$26,984,187	Virginia	$16,613,973	$8,857,019	$25,470,992	-5.94%
Washington	$14,012,182	$8,250,841	$22,263,023	Washington	$13,561,976	$7,493,408	$21,055,384	-5.74%
West Virginia	$5,933,288	$2,703,739	$8,637,027	West Virginia	$5,839,235	$2,488,384	$8,327,619	-3.72%
Wisconsin	$12,188,297	$7,233,733	$19,422,030	Wisconsin	$12,177,579	$6,575,694	$18,753,273	-3.57%
Wyoming	$5,000,000	$1,124,115	$6,124,115	Wyoming	$5,000,000	$1,063,125	$6,063,125	-1.01%
	CDC Total FY 08**	**ASPR Total FY 08****	**Grand Total FY 08****		**CDC Total FY 09****	**ASPR* Total FY 09****	**Grand Total FY 09****	**Grand Total Percent Change FY 08 - FY 09**
	$636,383,499	**$363,379,009**	**$999,762,508**		**$623,373,683**	**$330,359,658**	**$953,733,341**	**-4.83%**

**Note FY 2008 CDC total funding includes CRI, Level 1 chemical lab capacity, and EWIDS funding.*

***Note that totals do not include funds for 3 major U.S. metropolitan areas, Chicago, L.A. County, and New York City, U.S. Territories, such as Puerto Rico and Guam, and Freely Associated States of the Pacific, such as the Marshall Islands.*

Source: FY2009 Funding 1) CDC. Cooperative Agreement Guidance for Public Health Emergency Preparedness Program Announcement AA154 - FY 2009 (Budget Period 10). Atlanta, GA: U.S. Department of Health and Human Services, 2009, p. 24-26. <http://www.bt.cdc.gov/cotper/coopagreement/10/FinalPHEP_BP10_Guidance_5-01-09.pdf> (accessed September 11, 2009). 2) HHS/ASPR. FY09 Hospital Preparedness Program Funding Opportunity Announcement. Washington, D.C.: HHS/ASPR/OPEO/DNHPP, August 2009, p. 84-85. FY2008 Funding 3) HHS. HHS Provides More Than $1 Billion to Improve All Hazards Pubilc Health. News Release, June, 3, 2008. <http://www.hhs.gov/news/press/2008pres/06/20080603a.html> (accessed June 6, 2008). 4) CDC. Cooperative Agreement Guidance for Public Health Emergency Preparedness Program Announcement AA154 - FY 2008 (Budget Period 9). Atlanta, GA: U.S. Department of Health and Human Services, 2008, p. 22-24. http://emergency.cdc.gov/cotper/coopagreement/08/pdf/fy08announcement.pdf (accessed September 16, 2008)

APPENDIX B: H1N1 AND SEASONAL FLU SUPPLEMENTAL GRANTS BY STATE

H1N1 & SEASONAL FLU PREPAREDNESS EFFORTS FY2009 SUPPLEMENTAL				
State	**PHER Phase I**	**PHER Phase II**	**PHER Phase III**	**Total PHER Funding**
Alabama	$5,293,293	$3,981,585	$13,144,433	$22,419,311
Alaska	$770,350	$1,861,553	$3,623,681	$6,255,584
Arizona	$7,097,515	$4,827,276	$16,942,309	$28,867,100
Arkansas	$3,234,809	$3,016,715	$8,811,345	$15,062,869
California*	$30,516,050	$15,804,211	$66,238,117	$112,558,378
Colorado	$5,470,974	$4,064,869	$13,518,450	$23,054,293
Connecticut	$4,033,652	$3,391,156	$10,492,903	$17,917,711
Delaware	$981,504	$1,960,526	$4,068,155	$7,010,185
D.C.	$791,155	$1,313,787	$2,409,172	$4,514,114
Florida	$20,823,635	$11,261,100	$45,835,672	$77,920,407
Georgia	$10,778,540	$6,552,677	$24,690,834	$42,022,051
Hawaii	$1,478,835	$2,193,640	$5,115,037	$8,787,512
Idaho	$1,687,161	$2,291,288	$5,553,559	$9,532,008
Illinois*	$11,506,481	$6,895,159	$26,228,868	$44,630,508
Indiana	$7,266,971	$4,906,704	$17,299,011	$29,472,686
Iowa	$3,431,906	$3,109,100	$9,226,230	$15,767,236
Kansas	$3,180,938	$2,991,464	$8,697,946	$14,870,348
Kentucky	$4,840,932	$3,769,550	$12,192,218	$20,802,700
Louisiana	$4,934,975	$3,813,631	$12,390,180	$21,138,786
Maine	$1,520,366	$2,213,106	$5,202,457	$8,935,929
Maryland	$6,463,689	$4,530,183	$15,608,109	$26,601,981
Massachusetts	$7,409,340	$4,973,437	$17,598,697	$29,981,474
Michigan	$11,620,858	$6,947,495	$26,463,905	$45,032,258
Minnesota	$5,947,241	$4,288,110	$14,520,992	$24,756,343
Mississippi	$3,349,544	$3,070,495	$9,052,862	$15,472,901
Missouri	$6,724,990	$4,652,662	$16,158,145	$27,535,797
Montana	$1,086,439	$2,009,713	$4,289,046	$7,385,198
Nebraska	$2,034,662	$2,454,172	$6,285,045	$10,773,879
Nevada	$2,871,794	$2,846,559	$8,047,201	$13,765,554
New Hampshire	$1,512,677	$2,209,503	$5,186,272	$8,908,452
New Jersey	$10,042,502	$6,207,674	$23,141,477	$39,391,653
New Mexico	$2,249,089	$2,554,680	$6,736,412	$11,540,181
New York*	$12,767,560	$7,484,987	$28,877,702	$49,130,249
North Carolina	$10,194,394	$6,278,870	$23,461,208	$39,934,472
North Dakota	$730,996	$1,843,107	$3,540,842	$6,114,945
Ohio	$13,212,199	$7,693,403	$29,813,666	$50,719,268
Oklahoma	$4,119,303	$3,431,303	$10,673,197	$18,223,803
Oregon	$4,259,224	$3,496,887	$10,967,729	$18,723,840
Pennsylvania	$14,320,340	$8,212,819	$32,146,289	$54,679,448
Rhode Island	$1,228,009	$2,076,070	$4,587,048	$7,891,127
South Carolina	$4,973,517	$3,831,697	$12,471,312	$21,276,526
South Dakota	$899,128	$1,921,915	$3,894,757	$6,715,800
Tennessee	$6,950,724	$4,758,470	$16,633,313	$28,342,507
Texas	$27,060,583	$14,184,535	$58,964,392	$100,209,510
Utah	$2,934,572	$2,875,985	$8,179,349	$13,989,906
Vermont	$717,231	$1,836,654	$3,511,863	$6,065,748
Virginia	$8,797,303	$5,624,014	$20,520,344	$34,941,661
Washington	$7,361,687	$4,951,101	$17,498,388	$29,811,176
West Virginia	$2,092,381	$2,481,226	$6,406,542	$10,980,149
Wisconsin	$6,395,515	$4,498,228	$15,464,604	$26,358,347
Wyoming	$591,861	$1,777,890	$3,247,965	$5,617,716
	Phase I Total	**Phase II Total**	**Phase III Total**	**Grand Total**
TOTAL	**$350,000,000**	**$248,000,000**	**$846,000,000**	**$1,444,000,000**

**Note that totals include funds for 3 major U.S. metropolitan areas, Chicago, L.A. County, and New York City, and U.S. Territories, such as Puerto Rico and Guam, and Freely Associated States of the Pacific, such as the Marshall Islands.*

APPENDIX C: DATA AND METHODOLOGY FOR STATE INDICATORS

The data for the state indicators come from a variety of publicly available sources.

Indicator 1: Mass Distribution – Antiviral Stockpiling

Information available online at http://www.pandemicflu.gov/plan/states/antivirals.html (accessed November 25, 2009).

Indicator 2: Hospital Preparedness – Hospital Bed Availability Reporting

Information provided to TFAH by the Office of the Assistant Secretary for Preparedness and Response.

Indicators 3: Public Health Laboratories – Lab Pickup and Delivery Services

The Association of Public Health Laboratories (APHL) surveyed state public health laboratories between September and October 2009. All 50 states and D.C. responded to the survey. APHL confirmed each state public health laboratory's answer before submitting the final data to TFAH.

Respondents were asked:

Do you currently have courier systems (non-mail) in place to assure the timely transportation (pick-up and delivery) of samples 24/7 365 days to the appropriate public health LRN reference laboratory?

- Yes
- No (SKIP PATTERN)
- If no, why not
- Decline to Respond (SKIP 1a-1c)

Indicator 4: Public Health Laboratories – Surge Workforce

APHL surveyed state public health laboratories between September and October 2009. All 50 states and D.C. responded to the survey. APHL confirmed each state public health laboratory's answer before submitting the final data to TFAH.

Respondents were asked:

In response to an infectious disease outbreak, such as novel influenza A H1N1, does the state public health lab have the staffing capacity to work five, 12-hour days for six to eight weeks?

- Yes
- No
- Decline to Respond

Indicator 5: Biosurveillance – NEDSS Compatibility

In order to determine FY 2010 grant allocations, CDC's Division of Integrated Surveillance Systems and Services queried state health departments on their NEDSS status. According to CDC, for a state to be considered NEDSS-compatible, the state health department must have systems that meet three basic requirements:

1) An internet browser-based system;
2) Electronic laboratory results (ELR) reporting; and
3) An integrated data repository.

As of November 25, 2009, 44 states and the District met these requirements. The six states that did not meet this indicator were contacted via ASTHO to confirm CDC's results. In cases where state health departments disagreed with CDC's finding, TFAH worked with both parties to settle any discrepancies.

Indicator 6: Food Safety – Detection and Diagnosis

Data for this indicator were obtained from CDC's Foodborne Disease Outbreak Surveillance System (publicly available at http://www.cdc.gov/foodborneoutbreaks/outbreak_data.htm.) State health department are responsible for reporting foodborne disease outbreaks to CDC through the Electronic Foodborne Disease Outbreak Reporting System (eFORS).

TFAH analyzed data from 2005 through 2007 (the most recent year for which data were available at the time of publication). For each year, TFAH calculated the total number of reported outbreaks per state and the total number of reported outbreaks with confirmed etiology (bacterial, chemical, parasitic, viral, or multiple) per state. TFAH also calculated the national total number of reported outbreaks and national proportion of confirmed outbreaks. TFAH combined the 2005 to 2007 data and calculated the three-year average for each state and the nation. States that met or exceeded the national average of confirmed outbreaks (46 percent) achieved a point on this indicator; states that fell below the national average of confirmed outbreaks earned zero points.

All data for 2005-2007 were collected electronically through eFORS without confirmation of etiology by CDC staff; all etiologies are as reported by the state.

Indicator 7: Medical Reserve Corps Readiness

The Office of the Civilian Volunteer Medical Reserve Corps (OCVMRC) provided TFAH with data on 866 MRC units nationwide as of October 29, 2009. Variables included: state; MRC State Coordination, date established; NIMS compliance, and ESAR-VHP integration.

Indicator 8: Community Resiliency – Children and Preparedness

Data for this indicator was obtained from Save the Children's 2009 report on The Disaster Decade: Lessons Unlearned for the United States. Save the Children contracted with a law firm to review child care licensing, and K-12 school laws and regulations, for all 50 states and the District of Columbia focused on emergency preparedness. States were contacted when state laws or regulations were not found online or required clarification. Separate calls were made to child care licensing staff and to school personnel identifying the Save the Children project and criteria and seeking verification that the data found online was accurate. More information on the methodology and the report findings are available online at http://www.savethechildren.org/programs/us-programs/disaster-decade-lessons.html (accessed November 24, 2009).

Indicator 9: Entity Emergency Liability Protection

Faculty and staff at The George Washington University School of Public Health and Health Services and the University of North Carolina Gillings School of Global Public Health conducted the research and analysis for "Indicator 9: Entity Emergency Liability Protection." The GWU team also provided the analysis of Liability Protection for Volunteer Health Care Professionals. TFAH thanks:

- Nancy Lopez, JD, Senior Research Scientist, Department of Health Policy, George Washington University School of Public Health and Health Services;
- Ross Margulies, JD/MPH anticipated 2011, Research Assistant, Department of Health Policy, George Washington University School of Public Health and Health Services;
- Sara Rosenbaum, JD; Chair and Hirsh Professor, Department of Health Policy, George Washington University School of Public Health and Health Services; and
- Gene Matthews, JD; Senior Fellow, North Carolina Institute for Public Health, University of North Carolina Gillings School of Global Public Health.

Indicator 10: Funding Commitment – State Public Health Budgets

TFAH conducted an analysis of state spending on public health for the last budget cycle, fiscal year 2008-2009. For those states that only report their budgets in biennium cycles, the 2009-2011 period (or the 2008-2010 and 2009-2010 for Virginia and Wyoming respectively) was used, and the percent change was calculated from the last biennium, 2007-2009 (or 2006-2008 and 2007-2008 for Virginia and Wyoming respectively).

This analysis was conducted from September to October of 2009 using publicly available budget documents through state government web sites. Based on what was made publicly available, TFAH used either executive budget document that listed actual expenditures, estimated expenditures, or final appropriations; appropriations bills enacted by the state's legislature; or documents from legislative analysis offices.

"Public health" is defined to broadly include all health spending with the exception of Medicaid, CHIP, or comparable health coverage programs for low-income residents. Federal funds, mental health funds, addiction or substance abuse-related funds, WIC funds, services related to developmental disabilities or severely disabled persons, and state-sponsored pharmaceutical programs also were not included in order to make the state-by-state comparison more accurate since many states receive federal money for these particular programs. In a few cases, state budget documents did not allow these programs, or other similar human services, to be disaggregated; these exceptions are noted. For most states, all state funding, regardless of general revenue or other state funds (e.g. dedicated revenue, fee revenue, etc.), was used. In some cases, only general revenue funds were used in order to separate out federal funds; these exceptions are also noted.

Because each state allocates and reports its budget in a unique way, comparisons across states are difficult. This methodology may include programs that, in some cases, the state may consider a public health function, but the methodology used was selected to maximize the ability to be consistent across states. As a result, there may be programs or items states may wish to be considered "public health" that may not be included in order to maintain the comparative value of the data.

Finally, to improve the comparability of the budget data between FY 2007-2008 and FY 2008-2009 (or between biennium), TFAH adjusted the FY 2008-2009 numbers for inflation (using a 0.9975 conversion factor based on the U.S. Dept. of Labor Bureau of Labor Statistics; Consumer Price Index Inflation Calculator at http://www.bls.gov/cpi/).

After compiling the results from this online review of state budget documents, TFAH coordinated with the Association of State and Territorial Health Officials (ASTHO) to confirm the findings with each state health official. ASTHO sent out emails on October 23, 2009 and state health officials were asked to confirm or correct the data with TFAH staff by November 6, 2009. TFAH followed up via email with those state health officials who did not respond by the November 6, 2009 deadline. In the end, eight states did not respond by November 25, 2009 when the report when to print. Only one state, Colorado, refused to confirm or correct the data. These states were assumed to be in accordance with the findings.

METHODOLOGY FOR OTHER STATE DATA POINTS IN THE 2009 REPORT

Methodology for Health Care Volunteer Emergency Liability Protection

TFAH contracted with the George Washington University School of Public Health and Health Services. A research team consisting of an experienced lawyer and team members with experience in reading and interpreting statutory text assembled all relevant statutes and then assessed the statutes using methods of plain text analysis. Because of growth in the adoption of UEVHPA and the comprehensiveness of the statute, researchers adopted the following three-tier approach to the review:

1) States adopting the UEVHPA or enacting its full equivalent, as measured by the terms of state statutory law;

2) States whose laws offer some, but not all, of the emergency volunteer protections available under UEVHPA; and

3) States offering only minimal protections in the form of Good Samaritan Statutes.

The "minimal protections" or "low" category represents those states with only Good Samaritan or similar laws under which volunteers may be provided with an affirmative defense, but not necessarily immunity from liability. The "some protections" or "medium" group of states extend protections to volunteers during times of emergency, but may not explicitly identify health practitioners, may require affiliation with a regional or local emergency compact, or may not provide coverage to volunteers in the event of injury during rendering of services. Finally, the "UEVHPA" or "high" protection states have adopted the model statute or all of its elements.

Methodology Strategic National Stockpile

CDC's Coordinating Office on Terrorism Preparedness and Emergency Response (COTPER) provided states' technical assistance review (TAR) scores to TFAH. Scores are from the 2008-2009 review of state SNS plans. According to CDC, states must score 69 or higher out of 100 to satisfactorily document their SNS planning efforts. The passing grade will move to 79 for the Budget Period 10 (August 10, 2009 - August 9, 2010) funded reviews.

Methodology for Flu and Pneumococcal Vaccination Rates

TFAH contracted with Edward N. Okeke, PhD, MBBS, MPH, Department of Health Management and Policy, University of Michigan, Ann Arbor to conduct the statistical analyses.

Data for this analysis was obtained from the Behavioral Risk Factor Surveillance System (BRFSS) dataset (publicly available on the web at www.cdc.gov/brfss). BRFSS is an annual cross-sectional survey designed to measure behavioral risk factors in the adult population (18 years of age or older) living in households. Data are collected from a random sample of adults (one per household) through a telephone survey. The BRFSS currently includes data from 50 states, the District of Columbia, Puerto Rico, Guam, and the Virgin Islands. The most recent data available was 2008.

To account for the complex nature of the survey design and obtain estimates accurately representative at the state level, researchers used sample weights provided by the CDC in the dataset. The main purpose of weighting is to reduce bias in population estimates by up-weighting population sub-groups that are under represented and down-weighting those that are over represented in the sample. Also estimation of variance, which indicates precision and is used in calculating confidence intervals, needs to take into account the fact that the elements in the sample will generally not be statistically independent as a result of the multistage sampling design.

Researchers specified the sampling plan to STATA175 using the svyset command and the following set of weights: sample weight variable (FINALWT), first-stage stratification variable (STSTR), and primary sampling unit variable (PSU). Omission of the stratification variable in STATA implies no stratification of PSUs prior to first-stage sampling. Omission of the primary sampling unit variable implies one-stage sampling of elements and no clustering of sampled elements. Omission of the sample weight implies equally weighted sample elements. Mean proportions for each variable were estimated using the svy: proportion command.

Researchers estimated state-by-state influenza and pneumococcal vaccination rates among adults aged 65 and older. The influenza vaccination variable asks about flu vaccination within the past 12 months, while for pneumococcal vaccination, the individual is asked whether he/she has ever received a pneumonia shot. In all cases researchers exclude observations with missing data as well as observations where the individual either refused to answer, or replied, "Don't know". This never amounted to more than five percent of the observations.

Researchers used rolling three-year averages, first averaging data from 2005-2007 and then averaging data from 2006-2008 (after merging data from the relevant time periods). Researchers report mean proportions for each three-year period as well as standard errors and 95 percent confidence intervals for all variables of interest. Researchers also report p-values from a Pearson statistical test of proportions and indicate which states experienced a significant increase or decrease (significant at the five percent level).

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